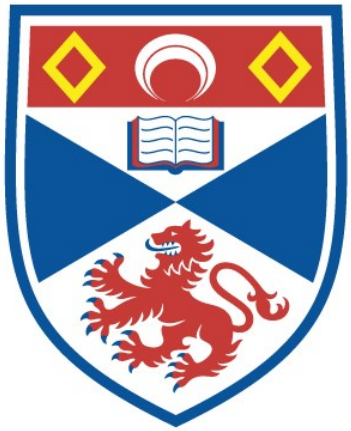
# Economic and social development in the Cycladic Islands, 1000 - 480 BCE

Douglas Charles Forsyth

A thesis submitted for the degree of PhD
at the
University of St Andrews



2020

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# Acknowledgements

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I would like to dedicate this work to the A team (Karen, Sean and Charlie) the greatest shipmates I ever sailed with, whether it be circumnavigating Vancouver Island, threading through the Bonifacio Straits, or in the roughest seas we ever encountered – inside the marina at Agios Nikolaos in a February storm. You are the best of the best. Θυμάστε τη Σύμη, είμαστε εδώ!

# Abstract

This thesis seeks to understand how economic and social development occurred in the Cycladic Islands between the end of the Bronze Age and the Persian Wars, 1000 – 480 BCE. The *longue durée* of the examination sets the remarkable 8th to 6th century Iron Age development of economic and social institutions into a diachronic context. A comprehensive set of archaeologically attested evidence from each island and each site was evaluated. This work fills a gap in scholarship as a synthetic analysis of the Iron Age Cycladic islands has not been done previously. The examination begins with the preceding Late Bronze Age palace-based social and economic systems with specific attention paid to associated trade routes. Following the end of the Bronze Age, an apparently uniformly low level of population across the islands was barely able to scratch out an existence in the 12$^{th}$ and 11$^{th}$ centuries. Beginning in the 10$^{th}$ century, evidence suggests that over the following centuries, on many of the islands, significant economic surpluses and robust social systems were generated. On other islands, evidence of complex development is not apparent. The trade routes and social structures of the Early Iron Age appear to bear little resemblance to those of the Late Bronze Age suggesting something different developed in the aftermath. This examination traces those developments throughout the archipelago on an island by island basis, noting changes in the material culture, social structure, technological innovations, and evidence of entrepreneurial enterprise that, in combination, led to the creation of economic surpluses. An analysis of the contributions of *phoros* to the Delian League shows that individual islands were assessed at different levels. This suggests that a range of economic strategies were pursued by the islands' inhabitants, some proving more successful than others. The development of successful economic enterprises is but one of a series of developments during the period and needs to be examined in a broad context that considers coterminous social development. The most successful economic strategies suggest a paradigm that perhaps can be applied to understand other societies' processes of regeneration following societal collapses in other places and periods.

Watched the men who rowed you

Switch to sail then steam

In your belly you hold treasures few have ever seen

Most of them dreams, most of them dreams.

Jimmy Buffett
*A Pirate Looks at Forty*
1974

# Preface

I first visited several of the Cycladic islands in 1980. I had read Herodotus and remembered the tribute lists from the Athenian Empire in which several of the islands were recorded as having paid very significant sums. The suggested prosperity of the ancients did not square with the brown, barren hunks of rock that I was seeing in the Cyclades. How could the people living on these denuded islands have generated the funds to make those tribute payments? Something must have happened to raise the profile of the people who had lived on these islands greater than their islands' physical characteristics would seem to support.

This thesis started with the objective of contrasting and comparing the histories of Crete and the Cyclades in the period following the end of the Bronze Age up to the Persian Wars in 480 BCE, the Dark or Iron Age. I was interested in what drove the inhabitants of Crete into the mountains where, by and large, they stayed and what the inhabitants of the Cyclades did to create their wealth. My hypothesis was that the Cretans had isolated themselves from the world while the Cycladic islanders had remained on the seashore and engaged with others, an examination of isolation vs. expansion. What became apparent after months of study was that the Cycladic story was much more nuanced. Rather than staying on the seashore, the evidence suggests that the population in the islands declined in the period following the end of the Bronze Age and only began to re-establish itself in the Geometric period. Moreover, each island's story was different. The combination of a nearly blank slate and a variety of individual solutions to the societal problem of economic productivity suggested the Cyclades were a ripe area for study of development in a pre-industrial context.

The Cyclades, as an archipelago, have largely been ignored in Iron Age studies.[1] Academic work in the Cyclades has focused on narrowly defined aspects such as sanctuaries or building types and has not looked at the full range of evidence synthetically. This thesis seeks to examine all the islands and sites with archaeological attestation (32 islands and nearly 130 sites) in order to develop an island by island understanding of the economic and social development that occurred between 1000 – 480 BCE.

Chapter 1 lays out the research question and the attractiveness of the Cyclades as an area of examination for this inquiry. The methodology of study and challenges or obstacles to the task at hand are elucidated. Introduced as well is New Institutional Economics which is utilized as organizational theory throughout much of the paper. As such, this builds on the work of a very influential school of thought in Iron Age Greek studies that I refer to as the Stanford School: Bang, Bresson, Manning, Morris, Murray, North, Ober, Sallares, Scheidel, and others. This work uses the Cycladic Islands as a case study to augment understandings developed in a mainland context and to apply them to an island environment dependent on maritime networks and differing environmental conditions. This thesis at times attempts to tweak or augment the work of the Stanford School but always in the spirit of building a more rigorous understanding.

Chapter 2 is a brief discussion on current scholarship. Chapter 3 conducts an historical review of the Late Bronze Age palace social structure and economic system and its associated trade routes. Attention is focused on how Iron Age trade routes differed from Bronze Age patterns and how these changes were fundamental to developments in the Cyclades. Chapter 4 is a lengthy examination of each attested site on each island in order to build a comprehensive database.

[1] Murray 2017, 27 excluded the Cyclades from her study on the demise of the Mycenaean economy focusing instead on Mainland Greece and Crete.

This was a laborious undertaking that has not been done elsewhere. About 60% of the way through the site studies an 'ah-ha' moment occurred. From the site evidence, I saw the development on some islands of what I have termed an additive economic strategy in which islanders pursued economic ventures that went beyond a basic agricultural subsistence level. Chapter 5 explores this strategic development and the social environment in which it occurred, applying the finding of the previous chapters to suggest a variety of economic strategies and social structures that Cycladic islanders developed by the Archaic period. These strategic choices were fundamental to building, or on some islands not building, significant economic surpluses. The social structure in which these choices were made was completely different from that of the Late Bronze Age. A brief concluding chapter summarizes the thesis and suggests possible geographical areas and time periods for future study where the models developed herein could be further tested.

All translations are done by author unless otherwise attributed. All dates herein are BCE unless noted differently.

# Abbreviations

### Written Sources

| | |
|---|---|
| *AA* | *Archäologischer Anzeiger* |
| *AR* | *Archaeological Reports* |
| *AR ID* | *Archaeological Reports Online* |
| *ADelt* | *Archaiologikon Deltion* |
| *AE* | *Archaiologike Ephemeria* |
| *BAR* | *British Archaeological Reports* |
| *BCH* | *Bulletin de Correspondance Hellénique* |
| *BSA* | *Annual of the British School at Athens* |
| *CAH* | *Cambridge Ancient History* |
| *IG* | *Inscriptiones Graecae* |
| *IGCH* | *Inventory of Greek Coin Hordes* |
| *OCD* | *Oxford Classical Dictionary* |
| *Prakt* | *Praktika tes en Athenais Archaiologikes Etaireias* |
| *SEG* | *Supplementum epigraphicum Graecum* |
| *TGL* | *Thesaurus Linguae Graecae* |

### Units of Measurement

| | |
|---|---|
| cm | centimeter |
| m | meter |
| km | kilometer |
| ha | hectare |
| nm | nautical mile |
| kts | knots = nautical miles per hour |
| dr | drachma |
| T | Talent, 6,000 drachmas |
| cwt | hundred weight = 112 pounds |

### Ancient Authors

Abbreviations for name of author and work cited are from *OCD,* 4th ed., xxvi-liii.
Format follows convention of book.chapter.section

# 1 Introduction

## 1.1 Aims of the Examination

This thesis will examine economic and social development in the Cycladic Islands between the end of the Bronze Age and the Persian wars, 1000 – 480 BCE.[2] The examination will consider all the major and minor islands that have archaeologically attested evidence for the period of study, 32 total islands with approximately 130 archaeological sites. The goal of the thesis is to understand how the economies and societies of the islands' inhabitants developed following the end of the Bronze Age.

This thesis covers a long period of time from the Aegean Bronze Age through to the Persian Wars for the purpose of demonstrating that Aegean society went from a relative high point in the Late Bronze Age through a considerable retrenchment in the Early Iron Age to recovering and ascending to a an even greater period of prosperity in the Archaic period.[3] The primary focus of the examination is the archaeology of the Cyclades during the 9$^{th}$ to 6$^{th}$ centuries when the evidence indicates a remarkable inflection point in the economic and social conditions occurred. The *longue durée* of the examination sets the Iron Age development of economic and social institutions into a comprehensive context.

The evidence gathered over the course of the investigation suggests three developments and one characteristic were fundamental to the diachronic transition from small post-Bronze Age defensively sited settlements to urban Archaic *poleis*.[4] One, was the islands' position along east to west Aegean trade routes which resulted

[2] All dates herein are BCE unless stated otherwise.
[3] Ober 2015, Fig. 1.1.
[4] Settlement growth is presented in section 4.7.

in Near Eastern technical innovations coming to Greece through the Cyclades.[5] Second, was the social development of devolved political authority to non-family members and the recognition of broad property rights.[6] Third, was the pursuit of additive economic practices on many of the islands, but not on all, of economic ventures that went beyond subsistence level agriculture.[7] These developments do not appear to have been sequential or dependent on one happening before the other, but there is evidence of each development in the Early Iron Age. The fourth factor is an observable characteristic of an entrepreneurial attitude among at least some of the individuals living in the Cyclades.[8] The earliest Greek pottery found at Al Mina in northern Syria was Cycladic.[9] Cycladic islanders were receptive to new technology and developed the first hard rock quarrying and marble sculpture in the Aegean.[10] The islanders were early coin minters and users of the Greek alphabet.[11] The adoption of these innovations suggest an entrepreneurial spirit existed in the Cyclades that was not always apparent in other Aegean islands such as Crete.[12] As the evidence will show, the economic and social development of each island was unique. These four observations are broad commonalities seen in varying degrees on those islands that established the largest economic surpluses by the late Archaic period.

At Koukounaries on Paros, dated to the 12th century end of the Bronze Age, a thick layer of ash, human and animal remains, bronze arrowheads, spearheads, and stone

[5] Presented in section 3.3.
[6] Evidence presented in site analyses in Chapter 4, summarized in section 5.4.
[7] Evidence in Chapter 4, analysis in Chapter 5.
[8] Discussed in sections 5.6 and 5.7.
[9] Vacek 2017, 49; Boardman 1996, 157.
[10] Discussion in Naxos section 4.3.3.3.
[11] Coinage discussed Paros section 4.3.2.3; alphabet under Thera section 4.5.1.2; both topics again in Chapter 5.
[12] See section 5.7 on Cretan conservatism compared with Cycladic exceptionalism during the Iron Age.

projectiles combine to strongly suggest a violent destruction occurred at this site.[13] Violent destruction horizons are not found elsewhere in the Cyclades but finds from the subsequent Protogeometric and Early Geometric periods are uncommon. Evidence of Protogeometric burials are found only at Grotta on Naxos and ceramics are limited mostly to Koukounaries on Paros, Xobourgo on Tenos and perhaps at Aghios Spyridon on Melos and Ayia Irini on Keos (see Appendix B, Table 5).[14] The lack of evidence suggests these were unsettled times. Yet, from this rather bleak starting point, Archaic remains suggest the inhabitants of the islands produced a range of social and economic developments in the years that followed. Settlements on Keos, Paros, Naxos, and Siphnos and sanctuaries on Delos, Despotiko, and Kythnos were adorned with marble temples and civic buildings.[15] Vrykastro on Kythnos, Palaeopolis on Andros, Ancient Melos, Minoa on Amorgos, and perhaps Chora on Ios had extensive fortification walls.[16] In contrast, evidence of nucleated settlements with monumental architectural features has not been found on Folegandros, Mykonos, Seriphos, Sikinos, and Syros indicating perhaps a lower level of social and economic development.[17]

Following the allied Greek victory against the Persians at Platea, after several machinations regarding leadership, the Greeks formed a collective alliance to finish the task of driving the Persians out of larger Greece including the islands and the Asia Minor littoral in 478/477. This alliance was titled the Delian League as it was

[13] Schilardi 1984, 187-90.
[14] Lambrinoudakis 2004; Schilardi 1984; Kourou 2011; Cherry 1982b, 306; Caskey 1971.
[15] Simantoni-Bournia, Mendoni, and Panagou 2009; Kourayos 2018b; Lambrinoudakis 2005; Televantou 2008b.
[16] Mazarakis Ainian 2005; Palaiokrassa-Kopitsa 2012; Catling 2005; Marangou 2002b; McGilchrist 2010(20).
[17] McGilchrist 2010(4); Vassilopoulou 2018; McGilchrist 2010(19); 2010(18).

headquartered at the Pan-Hellenic sanctuary of Delos.[18] Contributors were assessed both in-kind contributions (ships and sailors) and in silver.[19] Tribute levels (*phoros*) for each Cycladic island started off at a nominal level, even with some reductions during the *pentekontaetia*.[20] The assessments for the year 450/449 were (all in drachmas): Andros 600, Ios 100, Keos 400, Kythnos 300, Mykonos 150, Naxos 666.67, Paros 1620, Rhenia 5, Seriphos 100, Siphnos 300, Syros 16.67, and Tenos 300. By the mid-fifth century, Athens had taken over the Delian League and moved the headquarters and treasury to Athens. Following the start of the second Peloponnesian war, the taxes in 425/424 were increased dramatically, arguably up to the maximum level a *polis* or in some cases groups of *poleis* (Amorgoi, Keians, Mykonians, Sikinians) could pay.[21] Assessments per island varied considerably from a high in 425/424 in Paros of thirty talents to a low of less than one talent for Folegandros and Sikinos (see Table 1).

[18] Cartledge 2016, 146-7; Kagan 2003, 8-9; Meiggs 1972.
[19] Gabrielsen 1994.
[20] Wallace and Figueira 2010, 65-7; Meritt, Wade-Gery, and McGregor 1950, 57.
[21] See Rutishauser 2013, 93-7, Table 4.1; Wallace and Figueira 2012; Meiggs 1972 on tribute history; see Renfrew 1982b, 279 on assessment of 425/424 being maximum; Brun 1996, 191-2 suggests that 425/424 assessment was a reassessment by the Athenians of the true level of each island's economic output.

***Table 1 Islands Sorted by Phoros of 425/424.***

| Table 1 Selected Data on Cycladic Islands, after Renfrew 1982b, Table 20.2 with additional information. | | | | | | |
|---|---|---|---|---|---|---|
| **Sorted by Assessment** | | | | | | |
| Island | Total Area (km²) | Farming Area (km²) | Pct. Arable Land | Highest Point (masl) | Assessment 425/4 in Talents | Assessment per Farming Area (T/10 km²) |
| | | | | | | |
| Paros | 212.8 | 61.0 | 29% | 771 | 30 | 4.92 |
| Andros | 377.9 | 33.1 | 9% | 997 | 15 | 4.53 |
| Melos | 159.2 | 19.5 | 12% | 748 | 15 | 7.69 |
| Naxos | 412.4 | 98.3 | 24% | 999 | 15 | 1.53 |
| Keos | 153.8 | 49.8 | 32% | 562 | 10 | 2.01 |
| Tenos | 196.3 | 41.1 | 21% | 729 | 10 | 2.43 |
| Siphnos | 75.0 | 13.3 | 18% | 682 | 9 | 6.77 |
| Kythnos | 91.2 | 27.0 | 30% | 355 | 6 | 2.22 |
| Thera | 83.7 | 45.6 | 54% | 567 | 5 | 1.10 |
| Amorgos | 130.0 | 11.3 | 9% | 823 | 2 | 1.77 |
| Mykonos | 86.6 | 15.8 | 18% | 373 | 2 | 1.27 |
| Seriphos | 75.0 | 8.3 | 11% | 583 | 2 | 2.41 |
| Ios | 121.5 | 6.0 | 5% | 714 | 1 | 1.67 |
| Syros | 85.2 | 24.3 | 29% | 442 | 1 | 0.41 |
| Folegandros | 33.1 | 4.4 | 13% | 416 | 0.333 | 0.76 |
| Sikinos | 41.7 | 2.3 | 6% | 549 | 0.167 | 0.73 |

Scholarship has generally followed Thucydides's (1.95-.99) analysis that the Delian League changed from what was originally a voluntary association to an oppressive empire and that the increase in tribute was a direct expression of the transformation.[22] Some have suggested that the higher paying *poleis* were charged usurious amounts for having Medized when the Persians invaded.[23] Overlooked though is how the inhabitants of the Cyclades went about creating the wealth to raise the *phoros.* The ability of individual islands to pay the requested level of Delian League contributions, applied judiciously, may approximate a relative measure of economic output for each island. Paros at 30 talents is nearly four times the Cycladic average of 7.7 talents. Renfrew discussed using tribute levels for economic analysis in applying it

[22] Hornblower 2011; Low 2009; Osborne 2000; Brun 1996.
[23] Rutishauser 2012, 91-100; Wallace and Figueira 2010, 67-9.

to his study of the Melian economy.[24] Rutishauser discussed the sources of wealth generated on some of the islands but did not relate it explicitly to the level of *phoros.*[25] In this thesis, the discussion of disparate *phoros* levels is used to raise questions and help frame avenues for exploration.

The *phoros* tables as markers of economic output need to be used with caution. The potential for Athenian political manipulation of the assessments cannot be ignored. Friends may have been rewarded with lower assessments and dissidents punished with higher. The subsequent events of 415 makes it seem unlikely that the Melians paid their 425/424 assessment of fifteen talents. Additionally, the 425/424 assessment comes about 75 years after the period under examination which raises the possibility that during that interval conditions may have changed. The decline of mining output on Siphnos after 500 is an example of such a possibility.[26] The *phoros* tables are a measure of what was assessed, not what was paid. We know that in 448/447 there was a collection of payments in arrears.[27] Notwithstanding these precautions, arguably the Delian League assessments may give us a relative, but not absolute, measure of each island's populations ability to generate wealth; less ambiguous than other surrogates such as land area within fortification walls, number of marble temples built, or dedications found at Delos would.

For perspective, calibrating the amount of *phoros* with its purchasing power is helpful. From the 4th century Piraeus shipyard records *IG 2².1609* and *1628-9,* the penalty assessed against the captain for the loss of a trireme was 5,000 drachmas, the loss of

[24] Renfrew 1982b, 275-9.
[25] Rutishauser 2010, 51-65.
[26] Sheedy 2006a, 52; Gale and Stos-Gale 1981, 196.
[27] Meritt, Wade-Gery, and McGregor 1950, 44-49.

oars, rigging and spares an additional 5,000 drachmas.[28] Allowing for some depreciation, this suggests that the cost of an equipped new trireme was about two talents (12,000 drachmas). Consequently, the Parians' *phoros* of 30 talents would have financed the construction and outfitting of fifteen ships and the Therans' five talents, two and a half ships. The total 425/424 assessment of 123.5 talents would have financed just under 67 triremes. The analysis is not perfect as the *phoros* assessment is from the later 5th century and the cost data from the 4th century. Nonetheless, the conversion of *phoros* to ship units helps put the tribute level into context. The Athenian request seems large but not absurd.

Twentieth century scholars such as Finley, Snodgrass and others, held that the ancient economy was wholly or mostly agricultural.[29] If the ancient economy was in fact wholly or largely based on agriculture, then the *phoros* levels sorted by agricultural land area should demonstrate the point; the more agricultural land area the greater the economic productivity of an island should be, and consequently the higher the *phoros* assessment.

[28] Gabrielsen 1994, 139-45; Morrison and Williams 1968, 181-92.
[29] Finley 1981b, 185, 188; Snodgrass 1980, 124; Morris, Saller, and Scheidel 2007, 2; Morris 2002, 10.

***Table 2 Farming Area to Tribute Level***

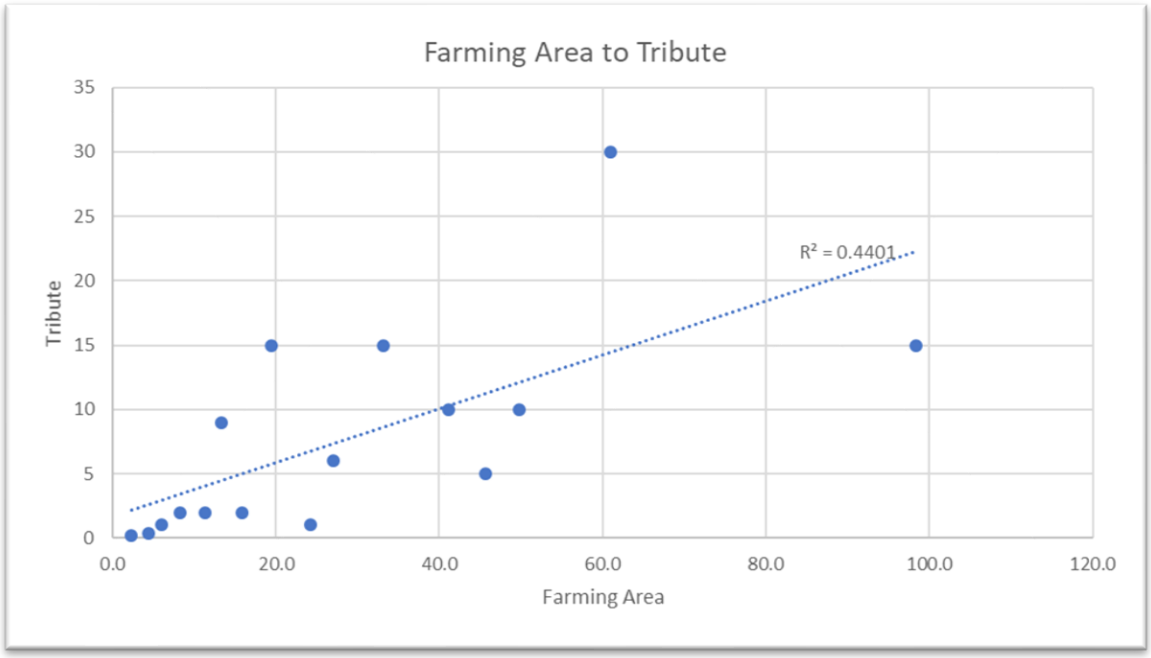



Table 2 shows that the correlation between agricultural area and *phoros* payments is not very strong, with an $R^2$ value of 0.44.[30] Paros had only 62% as much farmland as Naxos yet the Parians paid double the *phoros.* Siphnos had 84% the agricultural land as Mykonos but the Siphnians paid four- and one-half times more *phoros.* The 44% correlation of land to *phoros* suggests there was something more than just agricultural output involved in the various island's economies. Agriculture seems responsible for a portion of the economy but with an $R^2$ of 0.44, it is less than scholarship would have us believe. There appears to be a more complicated explanation than just agricultural output to what happened in the Cyclades.

[30] How arable land area was calculated is discussed below

If one accepts North's definition that an economic system is the process by which a society distributes finite resources, economics implies a social activity that occurs within a social structure.[31] Understanding the development seen in the Cyclades between 1000 – 480 necessitates an examination of the development of political and social structures as well as economic practices. One of the aims of this thesis is to try and understand just what the full suite of causal factors of development may have been. The scholarship regarding the developments that led to the *polis* has been a key component of Iron Age studies since the 1970s (discussed in Chapter 2). This thesis pays perhaps more attention to the economics of the period than the social changes as the Cycladic evidence of economic development is more robust than the evidence of social development but both factors are vital components in the overall development that occurred in the central Aegean.

## 1.2 Economic and Social Theory

Several different economic systems and social structures are observable over the chronological breadth of this thesis. The economic structures of the palace based Late Bronze Age economy differed from the primitive agrarian economy of the Early Iron Age which itself differed from the more complex linked economies that developed towards the end of the Archaic period. The centralized power structure of the Late Bronze Age was not recreated in the subsequent Iron Age. Rather we will see a gradual development from family units to eventually devolved authority in a broader civic system.

[31] North 2016, 3; 2005, 11; 1981, 4, 7-8, 13; see also Bresson 2016, 19-22.

In the mid-20th century the discussion of the ancient economy focused around Finley and Rostovtzeff who argued whether the ancient economy was primitivist (Finley) or modernist (Rostovtzeff).[32]

The substantive and formalist debate largely developed from the societal concepts that Polanyi added.[33] The primitivist/substantive view held that ancient societies did not have a stand-alone economic concept, rather the ancient economy was embedded in the other social structures and politics of society. It was a unitary structure in which the ruling elites shared morally and operationally a single economic outlook. The evidence for this interpretation came from the literary record, which, ironically, was largely produced by the ruling elites.[34]

The formalist view holds that the ancient economy was not imbedded but was a separate sphere, just less sophisticated than modern economies. Moreover, the formalist view held that profit-maximizing and want-satisfying were logical objectives of ancient societies.[35] This interpretation can be approached through the material record. More evidence of trade goods, bigger housing area, monumental public structures can now be placed in an economic framework that addresses a community's approach that was both profit-maximizing and want-satisfying.

The evidence strongly suggests that the ancient economy was not static, and it changed diachronically based on both the material and literary evidence.[36] The

[32] Morris, Saller, and Scheidel 2007, 2; Morris and Manning 2005, 12-14; Cartledge 2002, 15, each emphasized that primitivist/modernist and substantive/formalist are different constructs with different ramifications.
[33] Manning 2018, 9; Cartledge 2002, 17-19.
[34] Arist. *Pol.* 1333b 36-8, "the same ideals are best in both public and private life, and it is the lawgiver's task to implement them in the souls of mankind"; Manning 2018, xv.
[35] Bresson 2016, 13; Cartledge 2002, 15.
[36] Bresson 2016, 3; Saller 2002, 263; Mattingly and Salmon 2001, 11; Gallant 1991; Garnsey 1988.

Athenian economy of 750 was undoubtedly smaller and less sophisticated than the Athenian economy of 350.[37] As Table 2 suggests, the primitivist view did not capture the totality of the ancient economy.[38] Cartledge and Hopkins both commented that the ancient economy was mostly based on agriculture, but not entirely. The troubling question for them was how to quantify this observation, but as Cartledge noted, was it 65% rural or 85% rural?[39] Manning contends that the primitivist/modernist arguments have run their course as they are too simplistic, failing to consider human mobility and climate change.[40] Since the mid-1980s attention had turned to a new paradigm labelled New Institutional Economics (NIE) which, for this investigation, is more useful.[41]

The economic historian Douglass North considered institutions central to economic analysis.[42] North sought to analyse the institutions that condition and determine the performance of any economic system. The formative principle of NIE was to define relationships between people as transactions.[43] In this construct, the goal of human institutions is to reduce uncertainty in transactions between people.[44] Two examples of the reduction in uncertainty would be marriage between individuals as a guarantee

[37] Thomas and Conant 1999 provided a good diachronic examination of growth in material culture between 1200-700; see also Ober 2015, 103-22 on Greek economic performance 800-300.
[38] Manning 2018, xxii Finley's work was the end point of a school of economic development from Weber, subsequent work has been done with a very different underlying framework.
[39] Cartledge 2002, 14-22; Hopkins 1983, xiv; See Rose 2012, 134 for context.
[40] Manning 2018, xxii, 7, 15, 35-6.
[41] Prominent practitioners are Ober, Morris, Saller, and Scheidel all at Stanford, Bresson at Chicago, and Lyttkens at Lund University in Sweden; Morris *et al.* 2007, 11 refers to Neo-Institutional Economics; Bang in his 2009 *JRS* Vol. 99 review of Scheidel *et al.* 2007 titled his review 'The Ancient Economy and New Institutional Economics; Bang 2009, 195 wrote "At the moment, new institutional economics seems to be the body of theory with the greatest promise"; Bang, Ikeguchi, and Ziche 2006, 7-24.
[42] North 1981, 7-10; 2016 (28th printing of a work first published in 1990).
[43] North 1981, 17-18.
[44] North 1981, 31-2.

of stable life and filiation or a business contract which outlines the terms regulating an exchange of goods or services for a certain payment. Institutions are both formal (political offices) and informal such as acceptable codes of conduct within a society.

The economic goal of a society North argued is the maximization of benefits, within the constraints of that societies' institutions, by utilizing competencies and strategies with the lowest transaction costs.[45] This has the effect of taking the theory of comparative advantage from a gross benefit to a net benefit perspective. Consider as an example the Athenian agricultural model as legislated by Solon. Solon urged Athenians to produce olive oil and wine, crops which required less rainfall to grow than did grain, and trade those products for grain from areas that were able to produce grain at higher yields than Attica.[46] North added the insight that this trade strategy only works if transaction and transportation costs are lower than the differential in crop yields.

North focused on the costs of social parameters as the key determinate of an institution's success. Institutions are human constructs and new institutions could be developed that were comparatively more efficient than old institutions which, in time, would cause the older institutions to disappear.[47] Consequently one of the focuses of NIE inquiry is to explore the genesis of institutions. North did note that institutions had winners and losers. Institutions may be more optimal for some rather than

[45] North 2016, 27-35; 1981, 17-19.
[46] See Bresson 2016, 120-9 on the environmental conditions for grain, oil and wine production as well as Van Wees 2013b, 450-2, 457-60. See Van Wees 2013b, 463 on Solon's trade prohibitions; Solon F65, Meiggs and Lewis 1988, 30 = Fornara 1983, 63; Plut. *Sol.* 24.i.
[47] North and Thomas 1973 developed this construct in examining the change in the institutional framework of late medieval Europe as they were replaced by different institutions of the early modern era; North 2016.

others.[48] A lawfully established and organized *agora* with controlled weights and measures may be beneficial to the consumer overall but harmful to the seller in that the marketplace charged a fee to participate in it, which increased the seller's costs for a transaction. The changes in burial customs and cult practices observed at Koukounaries, Grotta, Yria, Zagora, Xobourgo and elsewhere (discussed in Chapter 4), that suggested the diachronic change in societal organization from family units to clan based to devolved authority in a larger group is the realized institutional development that North theorized.[49]

Bresson made the case that since institutions are deemed to have a logic related to each society and the technological constraints under which they developed they are the economical constructions of a society designed to serve that society at the lowest cost.[50] In this view, the observation that the Late Bronze Age palaces were not rebuilt following the Late Helladic IIIC collapse should be interpreted as the passing of institutional forms that no longer provided society with benefits greater than the costs associated with the palaces' use of resources.[51]

This investigation is necessarily focused on archaeological evidence as for most of the period under study there is no contemporary written evidence.[52] This presents a considerable challenge. Archaeological evidence of trade is more plentiful than evidence that leads to an understanding of the economic system(s) within which trade

[48] North 1981, 21-22.
[49] See Sections 4.3.2, 4.4.3, 4.4.1, 4.4.2.
[50] Bresson 2016, 24-25.
[51] Speaking at the British School of Athens' Annual Open Meeting in Athens on 16 February 2017, Irene Lemos in her keynote lecture on Lefkandi, remarked that following the LHIIIC collapse, people rejected the palace institution and *chose* not to recreate that system, precisely the NIE argument; North 1981, 22.
[52] Snodgrass 1980, 15-18; see also Rosenstock 2018 on economic reasoning and archaeology.

took place. As an example, copper ingots found in the Late Bronze Age Uluburun shipwreck tell us that copper as a raw material was being traded or exchanged, but for what, by whom, and under what terms is indeterminate.[53] Finley wrote that archaeological evidence by itself cannot uncover the legal or economic structures that written records can.[54]

NIE creates a logic that the material remains of a society would vary as different societies developed different institutions to support and organize themselves. An example (discussed in Chapter 4) would be an analysis of Andros in the 8th century where two separate Geometric communities, Zagora and Hypsili, demonstrated moderate diachronic changes in their settlement designs from foundation *c.* 925 until *c.* 700 when people from the two villages moved and merged into a new social construction centred at the new port location of Palaeopolis.[55] Palaeopolis developed into the central *polis* of the island and has physical remains such as an *agora* that suggest a different and more complex social structure than the Geometric period villages of Zagora and Hypsili where the most significant structure in each settlement was a single big house adjacent to smaller houses.[56]

Modern economic growth theory helps to further frame the discussion on economic development. Developed by economist Robert Solow and applied by Temin in a study of ancient Rome's market economy, growth theory helps to contextualize economic

[53] Pulak 2010; Bass 1991.
[54] Finley 1985, 25 "archaeological evidence or archaeological analysis by itself cannot possible uncover the legal or economic structures revealed by the Oxyrhynchus papyri…"; Snodgrass 1980, 123 acknowledged the difficulty of proceeding without a written record.
[55] Zagora was abandoned but a small community remained at Hypsili.
[56] On Zagora see Cambitoglou 1981; On Hypsili see Televantou 2012; On Palaeopolis see Palaiokrassa-Kopitsa 2012.

growth further than the broader approach of NIE.[57] Based on an analysis of empirical data from the United States economy between 1909-1949, Solow concluded that the greatest contributor to additive economic growth was technical innovation, not population growth, labour supply, or growth in the stock of equipment, the three primary inputs of classical economic theory.[58] The material evidence presented in Chapter 4 identifies specific examples of the four inputs; labour, capital, savings, and technological innovation. Examples to be discussed include growth in population documented by the increase in the number of settlement sites between 900 – 700 (see Figs. 4.133, 4.134), capital increase in extensions of arable land through terracing (Keos 4.2.2) or the construction of harbour facilities (Andros 4.4.1), savings in the creation of island sanctuaries and the establishment of treasuries at Delphi and Delos, and technical innovations such as hard rock carving techniques and heavy lift cranes (Paros 4.3.2 and Naxos 4.3.3).

The pursuit of additive economic policies is taken as a given by modern economists.[59] Trade in intellectual properties was generally not considered independently from the material goods that the intellectual property had a role in producing by those considering the ancient economy until recently. Bresson has applied Solow's observation to the ancient economy with great insight.[60] He wrote that the incentive to innovate lay in increased profits through a reduction in production costs. An example was the development of sail powered versus human oar powered water

[57] Solow 2000; 1956; Temin 2013, 211-12.
[58] Solow 2000, xi-xiii, xx-xxi; www.ubs.com.robert-solow; 1956; North 2005, 17 built on this "Increase in the stock of knowledge has been the fundamental source of human well-being."; Temin 2013, 211-14, Solow's MIT colleague, discussed Solow's model (Old Growth) and how it evolved (New Growth); see also Bakker 2018, 211-19.
[59] North 1981, 22 "By sustained economic growth I mean that output has grown at a more rapid pace than population."
[60] Bresson does not reference Solow directly but does so conceptually.

transport or using a water mill to turn a millstone versus a pack animal.[61] As it applies to the ancient economy, Bresson argued that technical innovation was a cost reducing strategy rather than creating new products for the market.[62] The Cycladic evidence though suggests that new products were developed. By virtue of their geographic position astride east to west trade routes, islanders had access to technologies and methodologies that were successfully applied to create new products such as marble quarrying and statuary. These new products were then traded for economic gain.

Growth theory has concentrated on the policy ramifications of what to do with the economic returns beyond subsistence levels; should they be saved, invested in new capital, or consumed, and in what ratios.[63] The first step though, must be to produce an additive economic return. Once additive economic returns were created, we can see ancient societies grappling with the same policy questions as modern societies do.

## 1.3 Why Economic Growth Matters

The term base economy is defined herein as the total system of agriculture, pastoral activities, fishing, home building, metallurgy to produce locally used tools and weapons, cult activities, pottery for local uses, textiles, etc., produced up to the level needed to support the community. If production of certain items intentionally goes beyond the level needed for local sustainability, that is considered an additive economic practice. This could include actions such as purposely growing more olives for oil extraction and export, making more pottery than locally needed, silver mining, marble quarrying, or moving the settlement to a coastal site in order to attract trading

[61] Bresson 2016, 208-9.
[62] Bresson 2016, 211.
[63] Solow 2000, xix, 11-15, 71-84.

ships to supply goods and services to them. Renfrew used the term production beyond subsistence (PBS) in his analysis of the development of the economy of Melos to refer to enhanced economic output.[64] The term additive economic strategy as developed in this thesis is preferred to Renfrew's production beyond subsistence. Renfrew's PBS terminology just addresses the first word, additive, in the preferred term additive economic strategy, i.e. the economic developments were additive to the base subsistence economy. The second word, economic, purposely highlights that these decisions were clearly economic, meant to produce additional goods and services that could be exchanged for material gain. Lastly, strategy, emphasizes the human agency of these developments. It was a human plan to take advantage of the natural resources, geographic position, and new technologies. It was an applied, practical strategy. The distinction between subsistence level economic activity and the development of an economic strategy that was additive, is the foundation block of this thesis.

Mathematically, the relationship between population growth and economic growth can be described in three possible scenarios.[65] One, is where population growth is equal to the economic growth. The economy produces the same amount of goods and services as the new population consumes, incomes are neither rising nor falling. Two, is when economic growth cannot keep pace with the population growth. In this scenario there are less goods and services per capita than there were previously; incomes are falling.[66] The third scenario is when economic growth exceeds population

[64] Renfrew 1982b, 267-8, 271, 277.
[65] See Saller 2002 on debate over growth in ancient world.
[66] Scheidel 2003, 129 In an analysis of records in Ottoman Greece between 1506-1570, noted the population was increasing while tax receipts were falling suggesting the economic strategy was not keeping up with increasing population.

growth. There are more goods and services for the population; incomes are rising.[67] More realistically, society is composed of multiple sectors where, potentially, for one sector incomes are rising, for another they are static, and for yet another, falling. This analysis amalgamates the multiple scenarios into an overall average. Conceptually, it separates growth into two parts; the economic growth associated with population growth and the economic growth independent of changes in population.[68]

The graph below demonstrates the three possibilities based on a theoretical population growth of 1% per year. The grey line is total economic growth of 1.25%; 1.0% for economic activity equal to the growth in population plus 0.25% additive economic growth. The orange line is 1.0%; population and economic growth being equal. The blue line of 0.75% is where economic productivity is not able to keep up with population growth of 1.0%, the situation in which individual incomes are falling.[69] The small change of 0.25% (1.25%, 1.0%, 0.75%), compounded over 300 years shows a dramatic separation between the three scenarios and serves as a visual ratification of why economic growth matters.

[67] North 2016, 19-24; 1981, 22-23.
[68] Often the terms total growth and per capita growth are used as the two components of analyses. Per capita growth is total growth divided by population to determine output per person. This allows us to determine if incomes are rising or falling. It does not reveal how much economic activity is related to population growth and how much to other economic activities. See Temin 2013, 214, 199; Morris 2005, 213-4 on difference between aggregate growth and per capita growth.
[69] Bresson 2016, xxi described these three scenarios as increase, stagnate or decline.

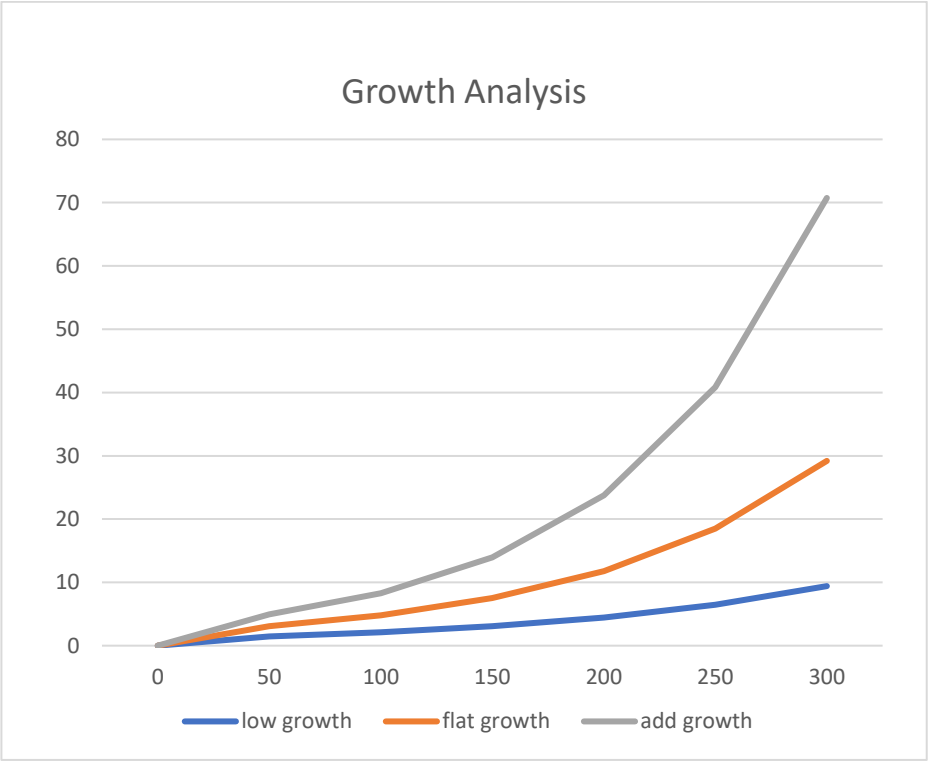



***Figure 1.1 Growth Analysis, three possible scenarios.***

*Key: Low growth = 0.75%, Flat growth = 1.0%, Add growth = 1.25%*

The pushing aside of the Primitivist approach has made economic analysis of ancient societies a fertile area of inquiry. Recent works by Manning, Murray, and Bresson as well as the continuing work of the Stanford School as referenced in the Preface, have offered a range of approaches to the material.[70] Evidence from the Cyclades has generally not been considered in these studies making a broad analysis of economic growth throughout the Iron Age Cyclades additive to the field.[71]

[70] Manning 2018, Murray 2017, Bresson 2016.
[71] Renfrew 1982b considered growth on Melos, but not across the islands.

## 1.4 Methodology

Different sites may reveal different patterns and alternative processes. To avoid skewing the data base it is necessary to examine the full range of information available. This examination will encompass all the Cycladic islands with Iron Age archaeological attestation, a total of 32 islands (not counting associated islets), with collectively about 130 archaeological sites. Each island's history is unique, requiring a survey of each one in order to truly determine larger patterns that might have existed. A study of this breadth for the Iron Age Cyclades has not been done previously.[72] This is a gap in the scholarship. Mainland Greece, Crete, and the Levant have been well studied.[73] The physical zone of the central Aegean that connects these areas though has not. The objective is to analyse every site in the Cyclades for which there is some degree of archaeological attestation (See Gazetteer of Sites). The depth of analysis for any one site is a function of the archaeological work done and its publication. For some sites, the evidence is voluminous and for others minimal. This is a bottom-up approach in that detailed site studies will be conducted prior to a holistic analytical examination.[74] Certain sites on Crete will be considered to provide comparanda to Cycladic developments or when a Cretan site is clearly illustrative of a diachronic process. Cretan site reports are presented in Appendix C. The dynamism of some Cycladic islands stands in contrast to the staid, withdrawn picture of contemporary Crete.

Three components of each settlement or cult site will be examined:

[72] Constantakopoulou 2007 and Brun 1996 looked at the entire archipelago but with differing areas of emphasis and different periods than this archaeologically based examination.
[73] On mainland see Murray 2017; Hall 2014; Osborne 2009; on Crete see Erickson 2010; on East see Manning 2018; on connectivity see Malkin 2011; Constantakopoulou 2007.
[74] Charalambidou, Kiriatzi, and Müller 2017, 109.

First, is to consider the macro view of a settlement's setting within the regional landscape and if the people of that settlement made diachronic changes in their chosen location. If the inhabitants subsequently moved, trying to develop an understanding of what aspects of the new location compelled people to move will be examined.[75] To illustrate; the evidence will show that on the island of Paros *c.* 650, the settlement sites at the northern end of the island were abandoned in what apparently was a move to the port settlement of Paroikia on the west coast (see Fig. 4.32).[76] This move coincided with the opening of marble quarrying in the mid-6th century near Paroikia. Conversely, on Keos, Iron Age settlements were founded at Koressos, Ioulis, Poieessa, and Karthaia. There appears to have been no move towards consolidation during the period of examination (see Fig. 4.6).[77]

Second, on a micro level, the internal plan of each settlement will be examined. Changes over time in building size, construction methods, communal spaces, and types of structures will be considered.[78] This is often best illustrated by changes in burial practices such as at Grotta on Naxos and Xobourgo on Tenos and in diachronic changes in cult structures from open air altars, to small structures with limited room inside for gathering, to larger multi-roomed structures with evidence of communal feasting such as seen at Koukounaries on Paros and Yria on Naxos.[79]

Third, a relative analysis in which relationships with other peoples evidenced in the material record, comprised mostly of ceramics, will be examined for imports at the site and exports from that community found elsewhere. From this evidence an

[75] Glowacki and Vogeikoff-Brogan 2011; Haggis 2012.
[76] Schilardi 2002; 1983.
[77] Cherry, Davis, and Mantzourani 1991a; Caskey 1971.
[78] Mazarakis Ainian 2017a.
[79] On Naxos see Lambrinoudakis 2004; on Tenos Kourou 2011; on Koukounaries Schilardi 1988; 1983.

appreciation of the expansiveness or isolation of the settlement and its economic design can be developed. Pottery from Paros is found over a wide area whereas finds of Naxian pottery have a more limited distribution.[80] Parian coins and ceramics found at Naucratis in Egypt and Egyptian faience scarabs found on the Delian hill across the bay from Paroikia, suggest an active mercantile element to the Parian economy.[81] Murray chose to define imports (and exports) as items coming from a different cultural entity (Egyptian or Phoenician compared to Greek, not between Greek communities), *i.e.* items found away from their original place of manufacture that can be clearly distinguished from the local material culture.[82] For her, an Athenian item found on Naxos would not constitute an import. This seems too restrictive a definition for application to the Cyclades. The physical location of the archipelago is that it sits at the intersection of trade routes between east and west, north and south.[83] It is a place where people, goods, and ideas pass through. For this analysis, we will consider any item not of local manufacture on that island, to be an import, whether it be from Egypt, Athens, or a nearby Cycladic island.

Morris wrote that the archaeological evidence from settlement and cult sites was too scarce to rely on in his study on the development of the *polis.* He argued that the record provided by burials was more voluminous, and in the case of Athens, more consistent across the period of study (1000-500).[84] The evidence presented herein of settlement locations, settlement plans, and material culture, examined diachronically, covering a wide variety of sites and social phases argues otherwise.

[80] On Parian exports see Paspalas 2012, 80; Papadoupoulos and Smithson 2002, 163-6, 175, 178-9; On Naxian exports see Charalambidou 2017, 383, 387-8; Coldstream 2009, 165-71.
[81] Rubensohn 1962, 73-6, 169.
[82] Murray 2017, 26-7.
[83] Broodbank 2013, 307-8; Constantakopoulou 2007.
[84] Morris 1987, 8.

Collectively, the analysis provides a robust set of data in which the evidence indicates that groups pursued a range of economic strategies.

## 1.5 Challenges to the Analysis

Three issues suggest why an examination such as this has not been previously conducted. First, the explanation of how the Cyclades developed such wealth in the Iron Age is quickly dismissed with the simple observation that Paros and Naxos had marble and Siphnos had silver and gold, end of examination. The ancient record, dismissive of Siphnian hubris discussed in section 4.2.5, is demonstrative of this conclusion. Such a simplistic approach ignores the other 29 islands which add considerable evidence to the wider picture. Second, as reviewed above, economic history was considered *per se* an impossible area of study from the Primitivist view, consequently economic development has been understudied until recently. Third, is the problems with the archaeology which make the evidentiary record frustratingly inconsistent. Morel commented that in examining economic history, historians and archaeologists have tended to focus on cities at the expense of territories, on cemeteries rather than settlements, and on art and craftspersonship at the expense of agriculture, manufacturing, and trade.[85] This lack of a wide perspective is compounded by the Greek ephorate system that creates specialists in one or two islands rather than generalists with broader responsibility. The demands of rescue digs on the ephorates gives little time for considered analysis across the region. Broodbank evaluated the early Cyclades for multi-period settlement excavations or extensive field surveys and rated only Amorgos, Keos, Naxos, and Melos as having good archaeological work done.[86] The inconsistency in archaeological investigation

[85] Morel 2007, 492.
[86] Broodbank 2000, Fig. 7.

and publication persists and in the Cyclades it is probably greater for the Geometric and Archaic period work than the relatively better examined Bronze Age.[87] Moreover, on a given island, not all pertinent sites have been investigated and published to the same degree. On Amorgos, Minoa has been systematically excavated but contemporary *poleis* of Aegiale and Arkesine have not.[88] This inconsistency in the quality of the material record makes developing definitive conclusions more speculative.

Archaeological bias is potentially a factor in our understanding of the record. Survey work in the Cyclades is minimal.[89] Excavations have naturally focused on sites with plentiful architectural remains such as Thera, Palaeopolis on Andros, Karthaia on Keos, and Sangri on Naxos at the expense of sites such as Poisseea, Koressos and Vrykastro on Tenos where remains are less obvious.[90] Recent archaeological work has been more focused on sanctuaries than settlement sites.[91] Complicating the archaeological record of the islands is that many of the successful Iron Age sites have subsequently been continuously inhabited with the result that earlier levels are inaccessible such as in Paroikia on Paros, Chora on Naxos, and Kastro on Siphnos.[92]

[87] Murray 2017, 27 excluded the Cyclades from her investigation as she found the information difficult to access coming from "a variety of perfunctory polyglot publications."
[88] Manoledakis 2012, 41; Marangou 2002b, 24.
[89] On northern Paros survey in 1970s see Schilardi 2002, 236; 1983, 174; on Keos see Mendoni 1994; Cherry, Davis and Mantzourani 1991a (northern Keos); See Cherry and Davis 1998, n5 on other surveys on Keos; *AR ID* 2012*,* 3258, report of current survey work on Keos not yet published; Reger 1997, 462, n71 gives summary of survey finds; Sutton 1991, 245 discussed pottery on Keos; Both Southern Naxos survey in 2017 and Kato Koufonisi 2019 are unpublished; on Therasia survey see Smonias, Farinetti, and Kordatzakis 2015.
[90] On Thera see Eustathiou and Vitis 2006; Sperling 1974; on Andros see Palaiokrassa-Kopitsa 2012; on Melos see Barber 2005; Cherry and Sparkes 1982; on Karthaia see Simantoni-Bournia, Mendoni, and Panagou 2009; Mendoni 1994; on Sangri see Lambrinoudakis 2005.
[91] Angliker and Tully 2018; Mazarakis Ainian 2017b; 1997.
[92] Kourayos 2018c; Brock and Mackworth Young 1949, 18.

Evaluating the Protogeometric and Early Geometric phases are challenging as the evidence for these periods is minimal. Nonetheless, we cannot dismiss the possibility that material has been overlooked or that the people simply did not leave an archaeologically attestable record.[93] All of this may skew our understanding of the Iron Age.

It also must be acknowledged that some of the analysis for the period is based on negative evidence, *i.e.* what did not happen. This is particularly true in the discussions on site abandonments. An illustrative example is Zagora. Zagora has stratified evidence of habitation at the site from 925 – 700. After 700, the deposits stop. There is Late Geometric pottery in the habitation areas but no Archaic ceramics.[94] Nor is there evidence of a destruction level. The presumption therefore is that the site was abandoned but this is not a positive attestation, it is marked by an absence of subsequent evidence.

Equally vexing is positively identifying where people went after a perceived abandonment. At the same time, the evidence of habitation at Zagora stops, there is evidence of initial habitation at Palaeopolis, ten km north situated on the coast. The assumption is that the people left Zagora and moved to Palaeopolis.[95] There is tangential evidence to support the movement; lack of water at Zagora, an attractive site at Palaeopolis with good water and a harbour. Subsequent cult activity at Zagora suggests that the former population, now at Palaeopolis, maintained a connection to

[93] Snodgrass 1980, 20-1 concluded similarly that Greece was "woefully underpopulated" in the 11th c., He tallied 320 known sites for 13th c., 130 for 12th c., and 40 for 11th c. It was the ratio between the number of sites that he considered important rather than the absolute number as new discoveries would over time be added to the totals.
[94] Cambitogoulou 1981, 20, 84, 99, 121.
[95] Hall 2014, 79.

their ancestral location reinforcing the presumption that they had resettled at Palaeopolis, but this is not positively attested and consequently is speculative.[96]

## 1.6 Geographical Area of Study

Several features make the Cyclades an ideal subject for investigation with perhaps wider applicability to enhance our understanding of how other communities developed.

The Cyclades were a geographical association, not political. Individual inhabitants referred to themselves by the name of their island and not the archipelago. The Delian League assessments were made against individual islands, not the archipelago.[97] Solon referred to the Φολεγάνδριος and Σικινήτης (see section 4.6.3), Herodotus (8.1.46) referred to the Κήιοι (see section 4.2.2.2), Archilochos to the οἰ Μυκονίων (LOEB 259, Archilochos 124), and Demosthenes (13.34) to the Σιφνίος and Κυθνίος as did Pausanias (10.11.2). The Delian Assessment against the three *poleis* on Amorgos were grouped into the collective term Ἀμόργιοι.[98] The introduction to Chapter 4 discusses which islands were included in the Cyclades by various ancient authorities, there was no uniform agreement.

From the Delian League *phoros* assessments, we can see a wide range of payment amounts from a high at Paros of 30 talents to low levels of less than one talent for Folegandros and Sikinos. This suggests that the islanders developed a range of social

[96] Cambitogoulou 1981, 84; Panagiotopoulou, *et al.* 2018 published a study tracking peoples movements in Early Iron Age Thessaly using strontium isotope analysis of teeth enamels and local water supplies to differentiate between resident populations and new comers which seems a promising technique in environments where water sources can be identified and differentiated.
[97] See Meritt, Wade-Gery, and McGregor 1950, the Tribute tables listed all islands as a single category not divided into regional subsets such as Cycladic, Ionian, Aeolic, etc.
[98] Marangou 2002b, 28, n80.

and economic solutions to generate wealth on their individual island. That those solutions produced results that varied considerably makes this a ripe area for examination. Several underlying causal factors that may have contributed to the divergent results can be suggested, geology, arable land, and location.

The geology across the archipelago is not uniform. The western islands of Keos, Kythnos, Siphnos, Seriphos, Kimolos, and Melos are all predominantly micaceous schists and blue or grey limestone with extractable mineral resources of iron, copper, lead, silver, and kaolin.[99] The central islands of Paros, Naxos and neighbouring smaller islands such as Keros, Herakleia and others are the above sea-level mountain tops of a larger formation. The rock is primarily metamorphic schists and marble.[100] Marble and emery were exploited but these islands lacked the mineral resources of the western islands. The northern islands of Andros and Tenos both are micaceous schists with iron and marble resources, neither of which seem to have been exploited in the Iron Age.[101] The southern island of Thera is unique in that it is largely covered in deep ash.[102] The range of mineral resources in the Cyclades indicates a variety of possible exploitations could have been pursued by the inhabitants.

Farming area as expressed in Table 1 was derived from a 1961 survey of the Cyclades by the Greek National Statistical Service.[103] The quantity of arable land as recorded varies considerably between islands and may have had an impact on each island's population levels and hence economic strategies. How closely these 1961 numbers reflect the amount of arable land in the Iron Age is impossible to determine. Arguably

[99] Cherry, Davis, and Mantzourani 1991c, 57.
[100] Bruno, Lazzarini, Soligo, Turi, and Varti-Matarangas 2010, 101-2.
[101] Sheedy 2006a; McGilchrist 2010, 104-5.
[102] Tzachili 2005, 244-5.
[103] Renfrew 1982b, 277; see Sheedy 2006a, 17-19 on other modern Greek surveys.

though, the economy of rural Greece in 1960 was not too far removed from the ancient economy. The Cyclades were not yet electrified and relied on the donkey for much of agricultural transport.[104] What is more important for this analysis is the relative assessment between islands rather than the absolute. As long as the percentage of arable land in antiquity between the islands was reasonably consistent with the 1960, the data, applied judiciously, can be useful. Geologically, the time span is not so long that rocky areas became fertile or vice versa between now and then. The amount of land made arable by terracing would be the main variable between periods.

Locative aspects in both a macro and micro sense makes an examination of the Cyclades particularly valuable. The Cycladic archipelago sits in the middle of the Aegean (see Fig. 4.1). Maritime traffic between mainland Greece and eastern areas such as Anatolia and the Levant in almost all cases must pass through the Cyclades. This allows for a study of the transfer not only of goods but of information and technology.[105] Innovations such as hard rock mining techniques, the alphabet, and perhaps the wide-spread use of coinage seem to have occurred in the Cyclades at an early stage in the Greek sphere.[106] Cycladic islanders were minting their own coins 70 years earlier than coins were first minted on Crete.[107] Within the Cyclades, location was potentially significant. A seemingly insignificant island like Donousa is perfectly situated as a first port of call in the northern Cyclades when sailing from east to west.

[104] The author first visited in 1978 and electrical power was only in the main towns on the major islands. Donkeys were more common than small pick-up trucks.
[105] Manning 2018, 7 considered movement and mobility through trade networks, migration, and resettlement important drivers of change.
[106] On hard rock mining see Fullerton 2016; Boardman 2006b, 18-19; 1978, 18, 22-3; Palagia 2006, 244; on alphabet see Lemaire 2008; Jeffrey 1990, Figs 44, 45. (reproduced in Chapter Two Figs 2.1, 2.2); on coinage see Sheedy 2006a, 47-51, 87-8; Stefanakis 1999.
[107] Sheedy 2006a, 4-5; Stefanakis 1999, 249-51.

Thera being the closest island to Crete is likely the reason that more Cretan material is found in Thera than in the other islands.[108] These contrast with Amorgos where the lack of imported finds suggest it is just far enough outside the preferred routes that it was isolated.[109] These aspects are discussed in greater detail on an island by island basis in Chapter 4.

The suite of variables, mineral resources, arable land, and locative attributes between the islands suggests an underlying dynamic of differences between islands that, while close together geographically, have very different resources. These variables transcend periodization.[110] Understanding how the differences manifested themselves makes the Cyclades a compelling area of inquiry.

## 1.7 Chronological Range of Examination

The 12th century Bronze Age collapse had different impacts on the inhabitants of the Greek mainland and the Aegean islanders. The evidence suggests the most common response by island populations to the upheaval was to move, abandoning their Late Bronze Age site for another location. In Crete, Kydonia, Agia Triada, Kato Zakros, and Kommos were abandoned.[111] In the Cyclades, the two major Bronze Age sites of Ayia Irini on Keos and Phylakopi on Melos were abandoned as was Aghios Andreas on Siphnos and Grotta on Naxos.[112] The people of Grotta appear to have moved inland a short distance but continued to use the old settlement area as a cemetery.[113] At

[108] On Donousa see Zafeiropoulou 1969; 1970; 1971; on Cretan finds in Thera see Erickson 2010.
[109] Marangou 2002b.
[110] Dawson 2014, 68.
[111] See Andreadaki-Vlazaki 2010, 526 on Kydonia; La Rosa 2010, 505-6 on Agia Triada; Platon 2010, 517 on Kato Zakros; Shaw and Shaw 2010, 543 on Kommos.
[112] Renfrew 1982a, 41-3 on Phylakopi; Deger-Jalkotzy 2008, 387 and Caskey 1971, 397-400 on Ayia Irini.
[113] Lambrinoudakis 2004, 61-2.

Koukounaries on Paros the site continued in use but there may have been a brief period when the area was deserted, the evidence is inconclusive.[114]

By the Archaic period, Andros, Melos, Naxos, Paros, and Siphnos developed urban centres and left a significant material record of exported goods, including ceramics and fine marble throughout the Aegean and beyond. Finds of Cycladic pottery are especially notable in Northern Syria at Al Mina, at Naucratis in Egypt, and on Euboea.[115] Thus the basic question of this study; how were the societies of some of the Cycladic islands able to achieve significant economic surpluses in the period between 1000 – 480?

Major changes came towards the end of the 6th century with the arrival of Persian aggressors to the region.[116] The cities of Ionia and the islands of the Aegean entered a prolonged period of hostility with the establishment of a permanent Persian presence in the region at Sardis.[117] Full scale maritime conflict occurred at Lade in 494 with the defeat of the Chian fleet by the Persians.[118] Persian dominance in the eastern Aegean left the small islands of the Cyclades vulnerable.[119] Thereafter the economics of war, specifically trireme based warfare which incurred dramatically higher costs than warfare had previously, changed the nature of relations and developments within the region.[120] The late 6th into the early 5th century marked a turning point

[114] Gounaris 2005, n118; Schilardi 1984, 204.
[115] Osborne 2009, 105-6, Fig. 27; Papadopoulos 1997; Boardman 1996; 1990.
[116] Cunliffe 2008, 317-21, Fig. 10.1.
[117] Hdt. 5.99-102.
[118] Hdt. 6.12-16.
[119] Hdt. 3.149, 6.31-32; Horden and Purcell 2000, 390 on island depopulation following Persian control.
[120] Rutishauser 2012, 81; Gabrielsen 1994.

between the developmental phase and subsequent phases in the geographical area of study making it a reasonable point at which to conclude this examination.

# 2 Recent Scholarship

## 2.1 Interrelationship of textual and material evidence

Papadopoulos noted that the Early Iron Age floated between the prehistorian and the classical archaeologist, unattached to either.[121] In what perhaps marked a transitional phase in scholarship, the historian Starr published a history of early Greece in 1962 that considered the written sources of Homer, Hesiod, Theognis, and Herodotus as well as the material record, but did not look towards mythology as explanatory evidence as some earlier scholars had.[122] Desborough looked for harder evidence of the movement of people which he found in the markedly different local scripts following the adoption of the Greek alphabet in the 8th century and in pottery designs (see Figs 2.1, 2.2).[123] The 'Dorian' script of Melos and Thera differs considerably from the 'Ionic' script of Paros and Naxos. Letter forms seem to have been localized in the 8th century becoming standardized throughout the 7th and 6th centuries.[124] Archaeology is still used by many to try and defend the historic tradition, but more commonly archaeological inquiry stands in isolation from the written record until the archaeological investigation is completed, after which the written record is looped back into the broader discussion.[125] Mac Sweeney used material evidence from the Late Bronze Age, Early Iron Age, Geometric and Archaic Periods in Asia Minor to determine just when trans-Aegean migration might have occurred. The material record was then cross-referenced against the linguistic record of Ionian place names. She

[121] Papadopoulos 2014, 178; 1994, 438.
[122] Starr 1962, xi, 67 commented that myths and legends have no place in "sober historical judgement"; 1986, ix; On use of myth see Stubbings 1992, 627-54 who commented "…their traditions were not the nebulous shifting mass that some modern historians would have us believe, but firmly anchored to places and objects." p. 629; Blegen 1993, 166-71; and even Murray 1993, 9.
[123] Desborough 1964, xvii, 19.
[124] Jeffrey 1990, figs. 44, 45; Johnston 1983, 67.
[125] Murray 2017; Mac Sweeney 2017 are excellent examples of this approach; Bohen 2017 though used traditional Athenian King lists to chronologically organize Attic krater designs.

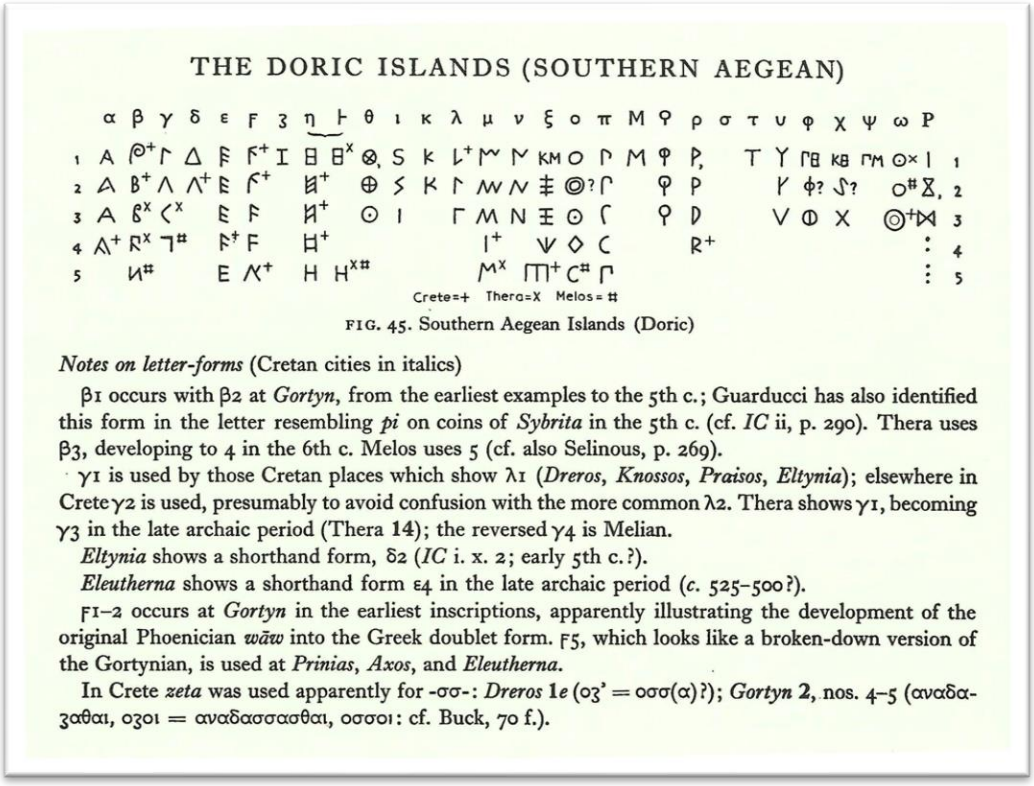
concluded that the material evidence demonstrated that the Ionian cities were inhabited long before the immigration tradition claims and that no large influx of people in the Early Iron Age can be demonstrated.[126] This thesis takes a similar approach wherein the material remains are first compiled, then cross referenced with the literary record where possible prior to analysis.

Davies, in his Iron Age studies, observed that the current synthesis of approaches is particularly complex as it is the product of three different philosophical approaches converging simultaneously.[127] One is the traditional linear historical approach based on the ancient literary sources. This contrasts with cultural historians trying to 'read' the ancient literature for how institutions, habits, cults, and mythology could be reflections of the social order under which the ancients interpreted and made sense of their world. These two literature based approaches meet, at times uncomfortably, with the archaeological approach that concentrated on the material culture to develop relative and absolute chronologies from which histories of occupation for various sites could be derived.[128] The methods and aims of the three approaches are not in perfect lockstep with one another which results is some academic discord on occasion. Morris described the friction well:

> Some of the best work in modern cultural history is being done on material culture, but few of the scholars engaged in it seem to care about how the archaeologists approach the world of things. As so often, promising lines of inquiry coincide with institutional and disciplinary boundaries.[129]

[126] Mac Sweeney 2017, 412.
[127] Davies 2013, 4-5; 2005.
[128] Morris 2000, 3-29 has a full discussion of the three approaches.
[129] Morris 2000, 9.

This convergence of competing approaches, and the large lacunae in the record of this data poor period, is likely the reason why no overall history of the Iron Age has been written. Instead, given the difficulties of examining the record chronologically, most authors have approached the period thematically.[130]



THE DORIC ISLANDS (SOUTHERN AEGEAN)

α β γ δ ε ϝ ζ η ϧ θ ι κ λ μ ν ξ ο π Μ ϙ ρ σ τ υ φ χ ψ ω Ρ

Crete=+ Thera=X Melos=#

FIG. 45. Southern Aegean Islands (Doric)

*Notes on letter-forms* (Cretan cities in italics)

β1 occurs with β2 at *Gortyn*, from the earliest examples to the 5th c.; Guarducci has also identified this form in the letter resembling *pi* on coins of *Sybrita* in the 5th c. (cf. *IC* ii, p. 290). Thera uses β3, developing to 4 in the 6th c. Melos uses 5 (cf. also Selinous, p. 269).

γ1 is used by those Cretan places which show λ1 (*Dreros*, *Knossos*, *Praisos*, *Eltynia*); elsewhere in Crete γ2 is used, presumably to avoid confusion with the more common λ2. Thera shows γ1, becoming γ3 in the late archaic period (Thera **14**); the reversed γ4 is Melian.

*Eltynia* shows a shorthand form, δ2 (*IC* i. x. 2; early 5th c.?).

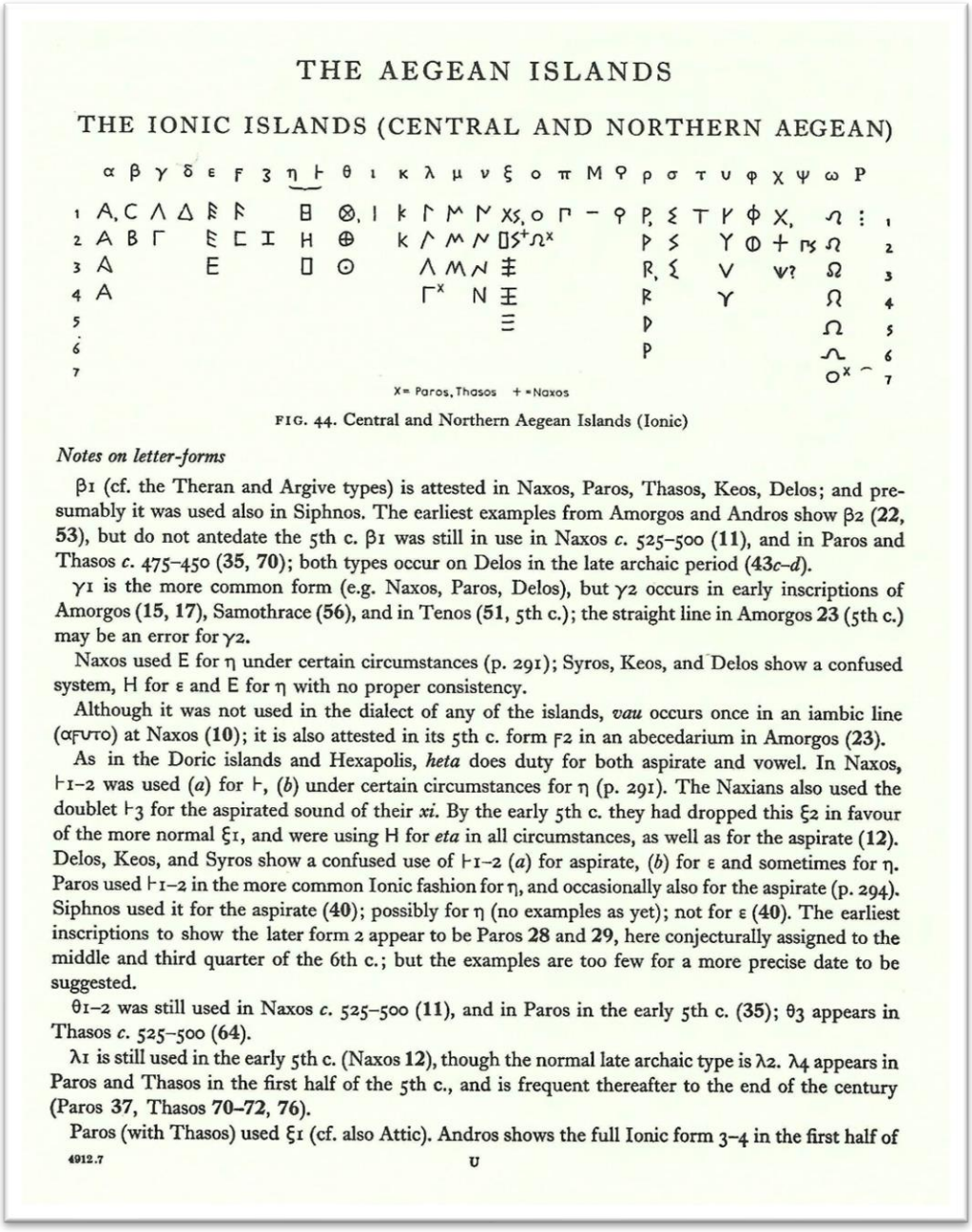
*Eleutherna* shows a shorthand form ε4 in the late archaic period (*c.* 525–500?).

ϝ1–2 occurs at *Gortyn* in the earliest inscriptions, apparently illustrating the development of the original Phoenician *wāw* into the Greek doublet form. ϝ5, which looks like a broken-down version of the Gortynian, is used at *Prinias*, *Axos*, and *Eleutherna*.

In Crete *zeta* was used apparently for -σσ-: *Dreros* **1***e* (οϛ' = οσσ(α)?); *Gortyn* **2**, nos. 4–5 (αναδαϛαθαι, οϛοι = αναδασσασθαι, οσσοι: cf. Buck, 70 f.).

***Figure 2.1 Jeffrey 1990, Fig. 45.***

[130] Hall 2014, Osborne 2009, Snodgrass 1980 as examples.



THE AEGEAN ISLANDS

THE IONIC ISLANDS (CENTRAL AND NORTHERN AEGEAN)

α β γ δ ε ϝ ʒ η ɦ θ ι κ λ μ ν ξ ο π M ϙ ρ σ τ υ φ χ ψ ω P

X= Paros, Thasos + =Naxos

FIG. 44. Central and Northern Aegean Islands (Ionic)

*Notes on letter-forms*

β1 (cf. the Theran and Argive types) is attested in Naxos, Paros, Thasos, Keos, Delos; and presumably it was used also in Siphnos. The earliest examples from Amorgos and Andros show β2 (**22**, **53**), but do not antedate the 5th c. β1 was still in use in Naxos *c.* 525–500 (**11**), and in Paros and Thasos *c.* 475–450 (**35**, **70**); both types occur on Delos in the late archaic period (**43***c–d*).

γ1 is the more common form (e.g. Naxos, Paros, Delos), but γ2 occurs in early inscriptions of Amorgos (**15**, **17**), Samothrace (**56**), and in Tenos (**51**, 5th c.); the straight line in Amorgos **23** (5th c.) may be an error for γ2.

Naxos used E for η under certain circumstances (p. 291); Syros, Keos, and Delos show a confused system, H for ε and E for η with no proper consistency.

Although it was not used in the dialect of any of the islands, *vau* occurs once in an iambic line (αϝυτο) at Naxos (**10**); it is also attested in its 5th c. form ϝ2 in an abecedarium in Amorgos (**23**).

As in the Doric islands and Hexapolis, *heta* does duty for both aspirate and vowel. In Naxos, ɦ1–2 was used (*a*) for ɦ, (*b*) under certain circumstances for η (p. 291). The Naxians also used the doublet ɦ3 for the aspirated sound of their *xi*. By the early 5th c. they had dropped this ξ2 in favour of the more normal ξ1, and were using H for *eta* in all circumstances, as well as for the aspirate (**12**). Delos, Keos, and Syros show a confused use of ɦ1–2 (*a*) for aspirate, (*b*) for ε and sometimes for η. Paros used ɦ1–2 in the more common Ionic fashion for η, and occasionally also for the aspirate (p. 294). Siphnos used it for the aspirate (**40**); possibly for η (no examples as yet); not for ε (**40**). The earliest inscriptions to show the later form 2 appear to be Paros **28** and **29**, here conjecturally assigned to the middle and third quarter of the 6th c.; but the examples are too few for a more precise date to be suggested.

θ1–2 was still used in Naxos *c.* 525–500 (**11**), and in Paros in the early 5th c. (**35**); θ3 appears in Thasos *c.* 525–500 (**64**).

λ1 is still used in the early 5th c. (Naxos **12**), though the normal late archaic type is λ2. λ4 appears in Paros and Thasos in the first half of the 5th c., and is frequent thereafter to the end of the century (Paros **37**, Thasos **70–72**, **76**).

Paros (with Thasos) used ξ1 (cf. also Attic). Andros shows the full Ionic form 3–4 in the first half of

4912.7 U

***Figure 2.2 Jeffrey 1990, Fig. 44.***

## 2.2 Approaches

Several works published after work on this thesis began have proven very helpful and much in keeping with increased academic attention to the Aegean Iron Age. Murray attempted to determine the degree of contraction following the Late

Bronze Age collapse though as examination of trade flows largely evidenced by pottery.[131] Unfortunately she did not consider Cycladic evidence in her study, just mainland Greek and Cretan. Lemos, in a broad examination of the Protogeometric period did consider evidence from the Cyclades.[132] Coldstream's dated but thorough treatment of Geometric pottery in all regions combined with these two publications provides a good foundation in the broad ceramic record.[133] Manning emphasized cross-cultural exchange which built on Bresson's work on the Greek economy more generally is which he pushes an argument that a study on economic growth is entirely appropriate.[134] These recent works did much to move the discussion away from earlier approaches. In the so-called 1980s-canon there was an emphasis on a sharp break from the Bronze Age while the 1990s-canon recognized more continuity with the Bronze Age.[135]

The 1980s approach described the steps that Greek society took to develop the *polis.* The leaders in this were Snodgrass and Morris.[136] Morris considered that the development of a social structure unique to the Aegean region, based on egalitarian male citizenship that led to the development of the *polis*, created the dynamic for growth.[137] Both Snodgrass and Morris relied heavily on evidence from Attic burials to support their conclusions. Economic considerations were largely not examined.[138]

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[131] Murray 2017.
[132] Lemos 2002.
[133] Coldstream 2003 (1977).
[134] Manning 2018; Bresson 2016.
[135] Morris 2000, 90-106 labelled these two schools the 1980s and the 1990s; Murray 2017, 11, 14-18; Papadopoulos 2014, 181-4; Lemos 2002, 1-2.
[136] Snodgrass 1980; 1987; Morris 1987; 1989.
[137] Morris 2006, 83-4; 2003, 30-33, 37-40, 44-45; 1987, 1-10.
[138] Snodgrass 1980; Morris 1987. The combination of economic and social analysis underlies New Institutional Economic theory as introduced above. To study economic or social development in isolation misses that they are integral to one another. See Bresson 2016; North 2016; 2005; 1981; Scheidel, Morris and Saller 2007; Morris 2007 adopted an integrated approach.

The 1990s approach argued for a more gradual transition in which continuity with the Bronze Age was the overriding characteristic. De Polignac, Langdon, and Papadopoulos favoured aspects of this approach.[139] De Polignac argued that the social archaeologists had focused too strongly on the formation of the *polis*. He focused on the sanctuaries that carried on from the Bronze Age and that many *poleis* used ancient sanctuary boundaries to define the limits of newly created non-secular *polis.*[140] De Polignac maintained this reinforced the social connection with the Bronze Age past.[141] Papadopoulos continues to suggest continuity arguing that patterns established in the Bronze Age were repeated in the Iron Age and that decentralization, rather than depopulation, explains the decrease in material finds.[142]

As one would expect, scholarship in the 2000s tended to draw from both viewpoints to develop a synthesis. Dickinson recognized that both interpretations played a role, consequently he subtitled his 2006 book "*continuity and change between the twelfth and eighth centuries BC."*[143] Osborne (2009) and Hall (2007) similarly drew from both approaches.

Archaeologists have specialized on specific sites such as Kourayos on Despotiko, Kourou on Xobourgo, Lambrinoudakis on Naxos, Mazarakis Ainian at Vrykastro on Kythnos, Mendoni on Keos, Schilardi on Koukounaries, Televantou on Hypsili and Aghios Andreas, among many others. Generally, Iron Age Cycladic archaeologists have not assembled the breadth of evidence in a comparative narrative.[144] One of the very frustrating aspects of archaeological scholarship has been the tendency of some excavators to hold onto their material as a kind of personal property right

[139] De Polignac 1995, 7,9; Langdon 1997, 2; Papadopoulos 1994.
[140] Pedley 2006, 52-6.
[141] De Polignac 1984; emphasized again in De Polignac 1995; See Morris 2000, 100-1.
[142] Papadopoulos 2014, 178; 1996, 254; see Dickinson 2006, 93-7 for counter argument.
[143] Osborne 2009; Hall 2014, 40-60; Dickinson 2006.
[144] Emphasis on 'generally', there are exceptions such as Kourou, Lemos and Mazarakis Ainian.

often resulting in a lack of publication. Within the span of working on this thesis there has been a change in this regard. Zafeiropoulou excavated many significant Cycladic sites such as Tsikalario, Vathy Limenari and the Vitzi cemetery in the 1960s. She has been releasing her material to Charalambidou and Agelarakis resulting in several excellent publications.[145] Televantou as well has recently published material on Hypsili and Aghios Andreas filling in large gaps in the record.[146]

As presented in the Chapter 1, the methodology used here has three components: a macro look at settlements in the landscape, a micro look at settlement structure, and a relative look focused on trade flows. Mazarakis Ainian, Gaignerot-Driessen, and Haggis have examined settlement sites and settlement plans diachronically. Gaignerot-Driessen and Driessen published a series of papers looking at site movements and developments in Archaic Crete similar to the methodology of study employed here.[147] Mazarakis Ainian examined structures designated as rulers' dwellings and cult buildings between the 11$^{th}$ and 8$^{th}$ centuries.[148] He organized the investigation by building typology (apsidal, oval, circular, etc.) and geographical distribution. He did not consider settlement sites in their entirety. His magisterial examination covered the whole of Greece. Methodologically missing in these studies was evidence of foreign contact; in particular, the aspect of trade route changes evidenced by material culture finds. Just as settlement sites changed locations and internal arrangements, so did trade patterns.

Recent works mentioned above have been helpful in filling this gap. Murray undertook an extensive examination of how and why the exchange economy of

[145] Charalambidou 2018; Agelarakis 2017.
[146] Televantou 2017.
[147] Gaignerot-Driessen 2017; Gaignerot-Driessen and Driessen 2014; Haggis 2014, 119-39 on the consolidation of refuge sites.
[148] Mazarakis Ainian 1997, 2, 36-8.

the Greek world changed in scale and structure between the 13th century and the 8th century through a rigorous examination of imports and exports.[149] Manning's recent work emphasized the value of cross cultural exchange in a general sense with emphasis on the Near Eastern and Mediterranean exchange.[150] Bresson, utilizing the NIE approach, suggested that institutions of a given society could be grouped into four sectors: political, symbolic, reproduction of persons (kinship), and production of material goods (economics).[151] Together these four sectors form a system with a specific structure. This creates a logic that the material remains of a society would vary considerably as different societies developed different institutions to support and organize themselves. This analysis can be quite insightful to the study of developing Early Iron Age societies where the material record comprises nearly all the extant data upon which an analysis of that society can be conducted. This suggests that expansive societies could be identified by remains of material culture that indicates a constant renewal of their societal base. An example would be an analysis of Andros in the 8th century where two separate Geometric societies, Zagora and Hypsili, demonstrated moderate diachronic change in the settlement designs until *c.* 700 when the two villages merged into a new social construction centred at the new port location of Palaeopolis.[152] Palaeopolis developed into the central *polis* of the island and has physical remains such as an *agora* that suggest a different and more complex social structure.

In addition to the regionally focused studies, Mediterranean wide studies have focused on connectivity over the *long dureé.* The founder of the 20th century version of this canon was Braudel whose history of Philip II of Spain sought to

[149] Murray 2017, 3.
[150] Manning 2018, xvi.
[151] Bresson 2016, 26.
[152] Note that Zagora was abandoned but a small community remained at Hypsili

emphasize the role of the environment in shaping the way in which a society developed.[153] Horden and Purcell, Cunliffe, Broodbank, Abulafia, and Manning have all built on this approach producing works covering multiple millennia of Mediterranean history.[154] The role of the exchange of ideas between people comes through as a central tenet in these works. Cunliffe recognized the importance of the Iron Age with his Chapter Nine title; *"The Three Hundred Years That Changed the World: 800-500 BC."*[155] Broodbank emphasized the development of sea-routes across the Mediterranean, especially between the Aegean and the Near East which will be seen to be of critical importance in the next chapter.[156]

These broad area studies incorporate significant climate data in their discussions, something that is generally not found in the regionally focused studies.[157] The introduction of the role of climate into the discussion opened a number of new areas of inquiry particularly the role of drought as a causal factor for large movements of people.[158] The specificity to which climate data can be applied is

[153] Braudel 1972; 2002.
[154] Manning 2018, Abulafia 2014, Broodbank 2013, Cunliffe 2008, Horden and Purcell 2000.
[155] Cunliffe 2008, chapter title 270, bronze age commentary 229-230, 236.
[156] Broodbank 2013, 546-56, figs 9.1, 9.5, 10.2.
[157] Broodbank 2013, 156-62, 371-2, figs 5.16, 5.21, 8.21; Horden and Purcell 2000, 175-90, 197-200,224-30, 328-38. Of interest is the treatment of scientific evidence from pollen cores found in the ice of Greenland, see Broodbank 2010, 42, 88, fig. 1.15; Renfrew 2008, 43-7, 50-51; Carpenter 1966 4, 9-11, 17-8, 60-7, proposed a three-century period of drought was responsible for the depopulation of Greece *c.* 1100-800 due to a shift of the normal north-easterly winds to drier westerly winds which effectively pulled the Saharan climate northwards into the Mediterranean basin. His data was derived from archaeological observation, ancient literary sources (Plato's *Timaeus* in particular), pollen deposits in northern European peat bogs and an analysis of sea and lake water levels; See discussion in Desborough 1972, 22-3.
[158] Cline 2014, 142-7 and refs, discussed climate change and resultant famine as a potential causal factor in the Late Bronze Age collapse of several Near Eastern cities and the Hittite Empire. Hittite queen wrote to Ramses II "I have no grain in my lands." Hittite text KUB 21.38 from Cline 2014, 143n18; Ladurie 1979, 287-8, 295-6 wrote that the roll of the historian regarding the role of climate is to provide archival data to the natural scientists to produce a clear picture of the changing meteorological patterns that occurred in the past. Only after such an understanding has been established can an investigation of the consequences of changing climate patterns be undertaken.

not clear. Knapp and Manning discussed the difficulties of merging scientific and archaeological analysis.[159] Heeding the caution of Ladurie, they questioned the validity of narrow dating of climate events as they maintain that sample sizes of measurements are too small for the conclusions reached, while accepting that the data can support broader and useful generalizations.[160]

With this scholastic framework, we now turn to what in strategic analysis would be termed the *Prior Condition*, the Late Bronze Age palace based economic system and the trade routes it engendered.

[159] Knapp and Manning 2016, 100-112.
[160] *Ibid.*, 103, 108, 109, 111, n30, n31.

# 3 Historical Review

## 3.1 Introduction

As discussed in the previous chapter, while there is continuing scholarly debate regarding the degree and manner of continuity that occurred in the Aegean region at the end of the Late Bronze Age, there were several aspects of the social and economic fabric of Aegean society that undeniably did change.[161] Understanding what these were and considering the ramifications of such changes underlie much of the discussion that follows. Two topics will be explored in this chapter; the Middle and Late Bronze Age palace system that developed in Crete, and the change in trade patterns that occurred between the end of the Bronze Age and the 9th century when long-distance, water borne trade is observable again in the material record. These factors demonstrate quite clearly that the social and economic systems of the two periods were fundamentally different.

## 3.2 Palace System

The palace system in the Aegean was unique to the Middle and Late Bronze Age. Palace architecture went through several successive design phases as the structures were rebuilt following destructions from either natural or human causes multiple times during the Bronze Age.[162] In Crete, the first palatial phases are observable *c.* 2000 at the start of the Middle Minoan period (see Appendix A on pottery sequences).[163] An architectural feature evident from the early Prepalatial levels was storage areas. From Phaistos phase 1 (2000-1800), four

[161] Murray 2017, 9-11 and Cline 2014, 124-35 on the severity of the break; Klein and Glowacki 2009, 153-4, 166 build a compelling case for continuity in architecture of cult spaces.
[162] Younger and Rehak 2008a, 141 almost all palaces were destroyed by fire at end of MMII. Knossos, Phaistos and Malia were rebuilt on a larger and grander scale; Preston 2008, 310-11 another round of destructions date to LMII; La Rosa 2010, 585-93 Specific to Phaistos, palace built MMIA, rebuilt MMIB, at end MMIIB was rebuilt twice after earthquakes a few years apart, rebuilt MMIIIA, LMIB rebuilt twice after fires, rebuilt after earthquake and fires LMIIIA1-A2.
[163] Hitchcock 2010a, 191; Manning 2008, 105-6.

rooms out of a total of fourteen spaces held 67% of the pottery remains suggesting they were storage facilities (see Fig. 3.1).[164] In phase 2 (1800-1700), storage areas for holding grain (*koulouras* – circular stone-lined storage silos) with a capacity of 1,500 cwt were added. This is roughly equal to a year's supply of grain for 300 people.[165] At Knossos, from Middle Minoan IA, West Magazines numbers eleven to sixteen were built (See Fig. 3.2). During Middle Minoan IIB, grain storage areas with a capacity of 5,000 cwt – a year's supply for 1,000 people were added, as well as increases to the pithoi storage capacity on the east side of the Central Court.[166] By the Late Minoan period, one-third of the area of the palaces at Knossos, Phaistos, and Kato Zakros were devoted to storage facilities, and even a larger percentage at Malia (See Fig. 3.3).[167]

[164] Branigan 1987, 245-7, Table 1.
[165] Branigan 1987, 247. Branigan's calculation seems reasonable; 5 cwt per person works out to 560 pounds per person per year (British long cwt, 112 pounds), just over 1.53 pounds of grain per day. 1.5 pounds of grain produces 1.5 pounds of whole wheat flour which in turn makes 2.25 pounds of whole wheat bread. Conversion factors from www.oces.tulsacounty.org (agricultural newsletter) accessed 2 March 2018.
[166] Macdonald 2010, 534-5; Branigan 1987, 247-8. Capacity determined by dimensions of the *koulouria.*
[167] Hitchcock 2010a, 194; Begg 1987, 179-84.

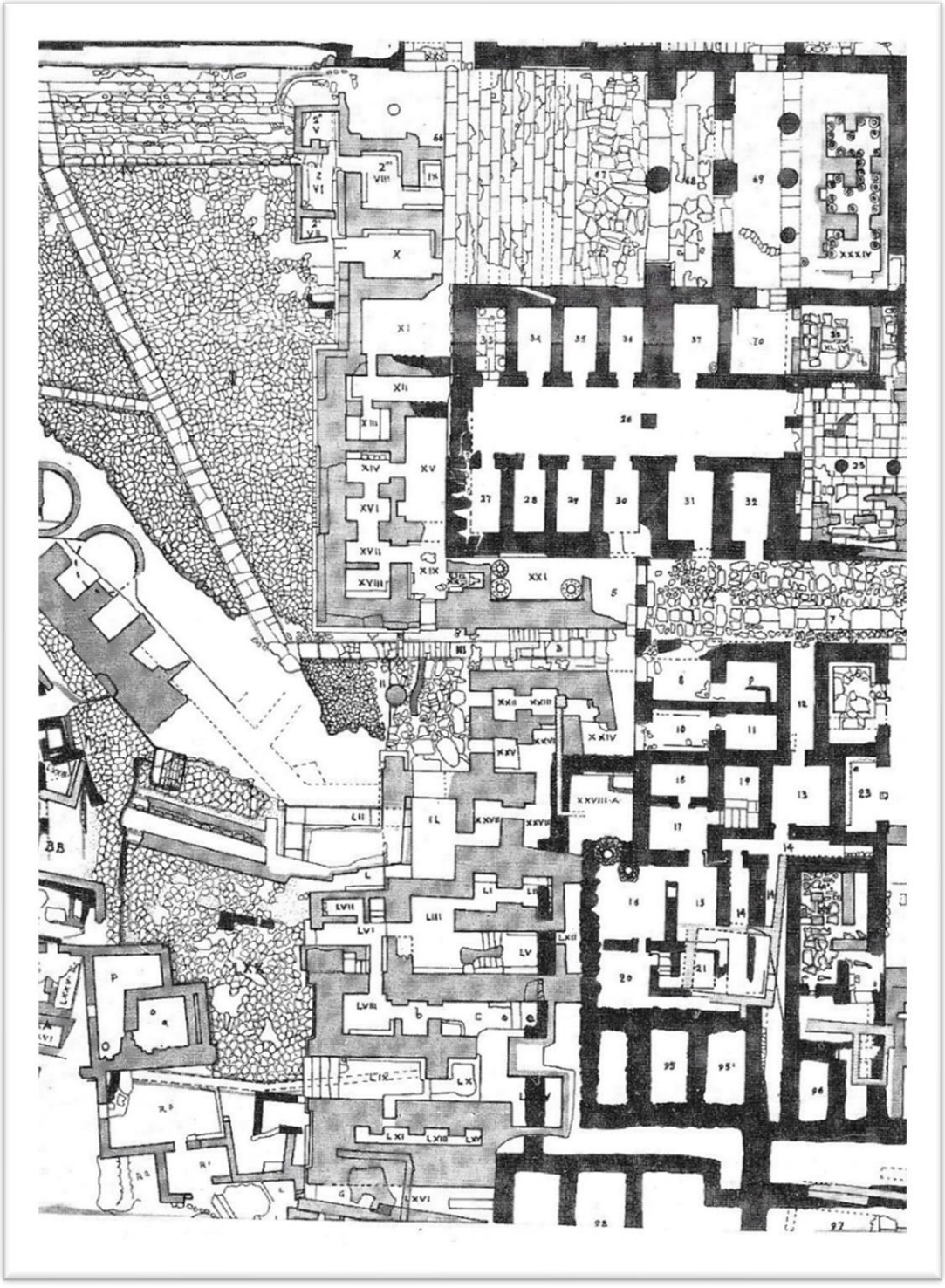

***Figure 3.1 Phaistos, First Palace Phase 1a and 1b. From Warren 1987, Fig. 1.***

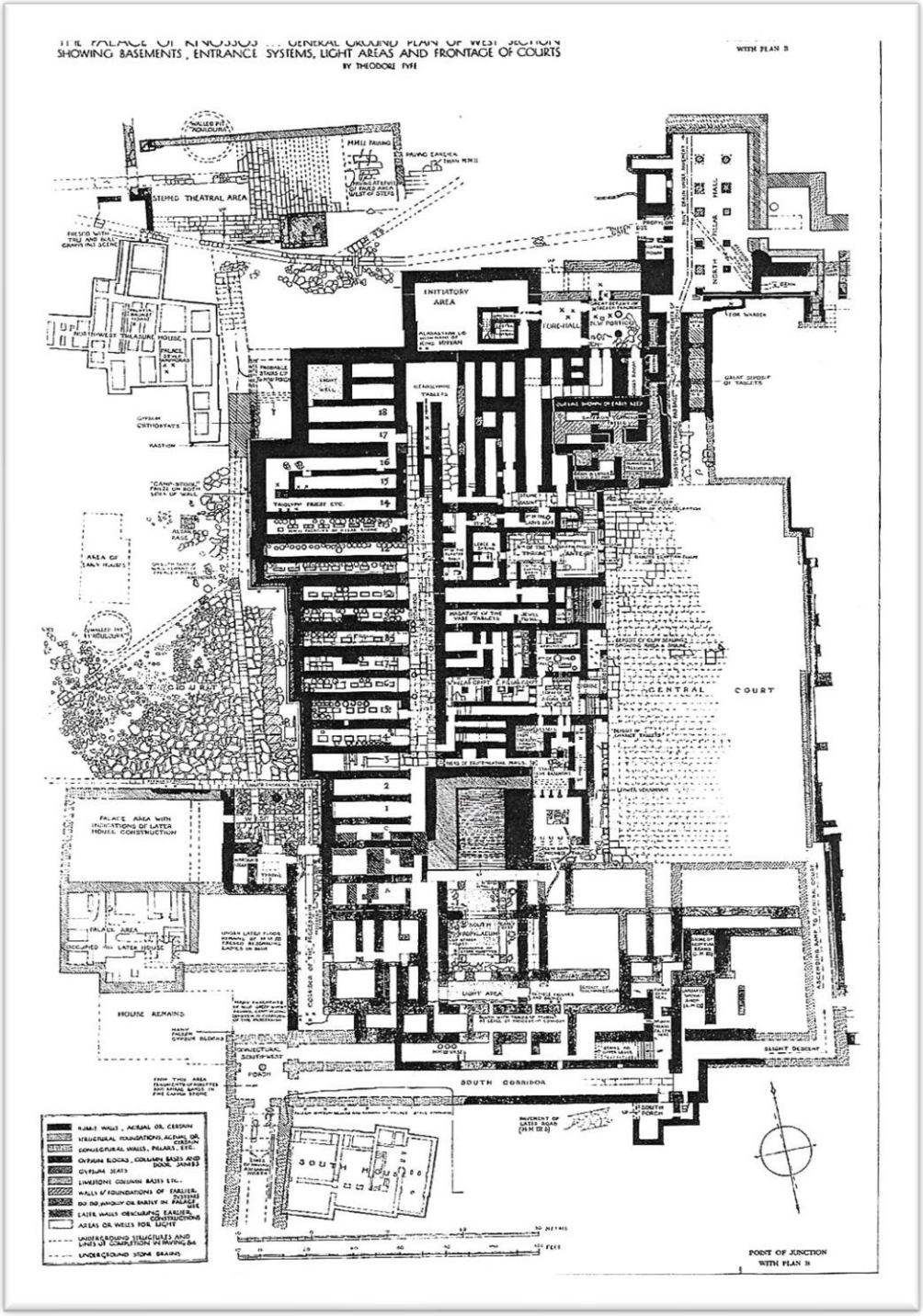


***Figure 3.2 Plan of Western Side of Knossos. From Macdonald 2010, Fig. 40.1a (from Evans).***

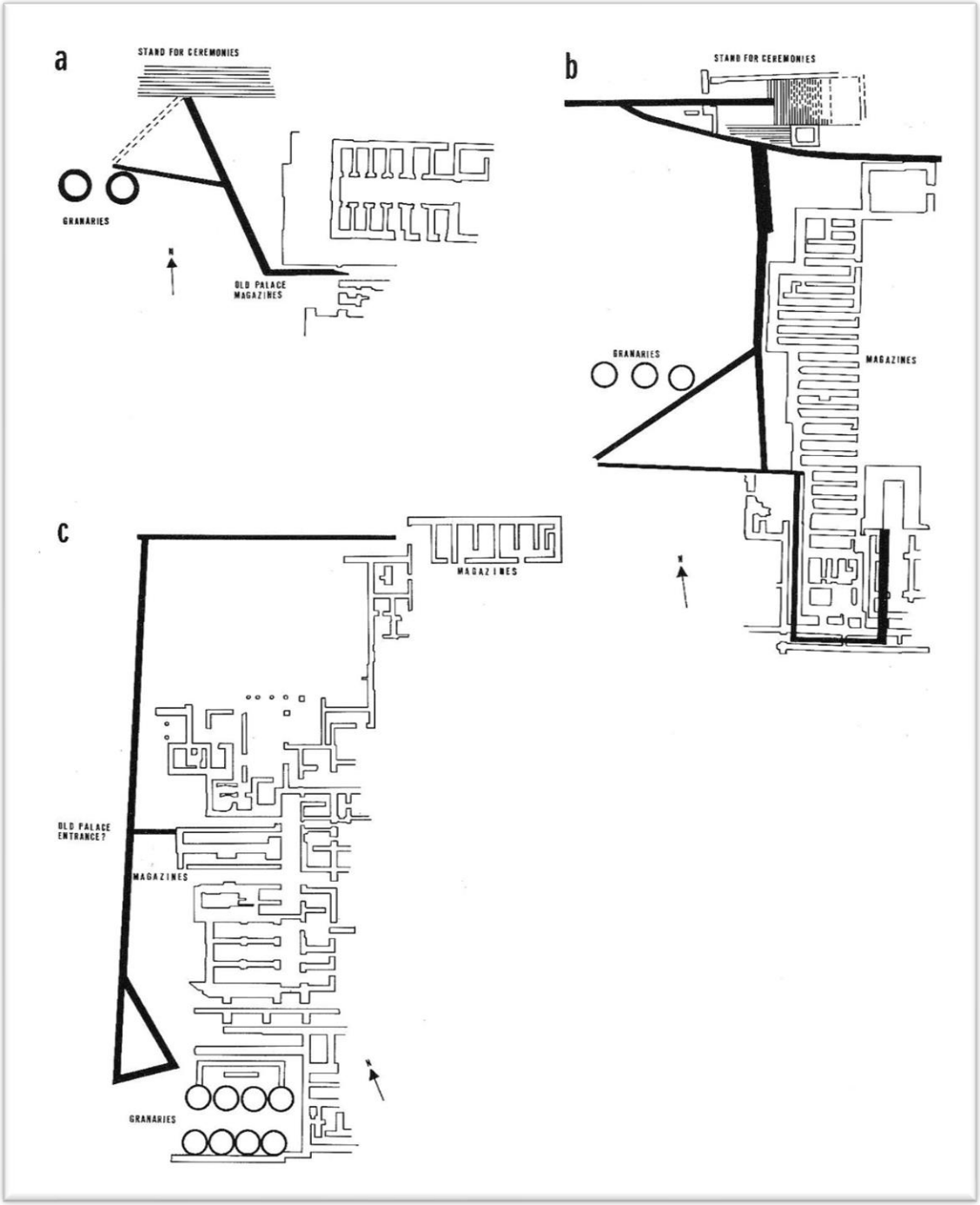


***Figure 3.3 Magazines and Granaries from a) Phaistos, b) Knossos, c) Malia. From Marinatos 1993, Fig. 38.***

Systematic record keeping including hieroglyphic marks, Linear A tablets, and two different types of clay sealings (one apparently impressed on a leather bag and the other fashioned around two ends of a cord before stamping) were apparent from the early palace levels.[168] Understanding of the economic system(s) of the Late Bronze Age Aegean was considerably enhanced with the decipherment of Linear B.[169] These tablets revealed extensive accounting records wherein palace scribes recorded inventories of textiles, furniture, livestock, agricultural produce, metals, military equipment, etc.[170] The combined evidence of storage facilities and record keeping led Finley to develop his theory that the Aegean Bronze Age palace centres were hubs in redistributive economic systems.[171]

In Finley's view, the Aegean system described in the Linear B tablets was along the lines of Near Eastern palace systems.[172] The role of the Near East in the development of the palace system is one of scholarly debate.[173] Watrous argued in the 1980s for a diffusionist approach as he saw extensive Near Eastern religious and political forms in Early Minoan III-Middle Minoan II Crete.[174] He argued that later, *c.* 2000, writing, monumental ashlar architecture, peak sanctuaries, pithos and larnax burial practices, and specialized wheel-made pottery all appeared in

[168] Macdonald 2010, 536; Shelmerdine 2008, 11. Cretan Hieroglyphic writing system dated from MM IA-II, Linear A from MM IB- LM IB, Linear B LM II-IIIB; Branigan 1987, 248; Begg 1987, 181, n21, n22, The first presumably sealed a pouch of materials and the second a bundle wrapped with a cord, see Weingarten 1991; Pope 1964, 1-8, p. 6 on pre-Linear A writing systems.
[169] Ventris and Chadwick 1956, 153 tablets were selected to be "the most interesting" arranged thematically, Personnel lists, Livestock and Agricultural Produce, Land Ownership and Land Use, etc.; Dow 1992.
[170] Nakassis, Galaty, and Parkinson 2010, 242; Shelmerdine and Bennet 2008, 289-92; Renfrew 2011, 296-7; Finley 1957, 134-5, 134n6; Ventris and Chadwick 1956; Palmer 1958, 87.
[171] Finley 1957, 135; Palmer 1958 challenged Finley's understanding of land use and land ownership based on Finley's analysis of the Linear B tablets but left unchallenged Finley's redistributive economic system interpretation; Finley 1981a, 37 maintained his earlier redistributive analysis was correct; Bennet 2007, 190 discussed the lasting impact of Finley's interpretation.
[172] Finley 1957, 134n5, 136 cited the Sumerian city of Lagash as a model.
[173] Manning 2008, 105-16; Foster 1987, 11-16.
[174] Watrous 1987, 65-70.

Crete for the first time. Each of these developments, Watrous claimed, had antecedents in various regions of the Near East including Syria and Canaan (except for writing - the Cretan hieroglyphic script which, excepting a few Egyptian characters, does not have Near Eastern forms).[175] Subsequent academic thought leans more towards an endogenous explanation, as many of the social practices and architectural forms had Early Minoan roots from which Middle Minoan forms plausibly developed.[176] Renfrew suggested there was not sufficient Near Eastern origin trade evidence found in the Early Bronze Age Aegean to support a diffusionist explanation.[177]

Building on the work of Ventris and Chadwick, subsequent interpretations of a database comprised of over 5,500 Linear B tablets from multiple sites, together with archaeological evidence indicative of portions of the economy that were not textually recorded, now suggest a considerably more nuanced economic system than the redistributive interpretation.[178] Killen and Earle both suggested (independently) rather than a centrally controlled system overseeing the entire economy, the evidence indicates the Palace controlled only specific levels of economic activity; focused on those aspects it wanted to control for its own benefit and enhancement.[179] Foremost among these were luxury items evidenced in the tablets such as gold, ivory, and perfumed oils (perhaps for export as discussed below) where strict in-and-out inventories were kept of both the materials and the labour.[180] Textile production is demonstrative of this system.

[175] Watrous 1987.
[176] Manning 2008, 106-10, 118-20; Whitelaw 2004, 232-56.
[177] Renfrew 2011, 474-5.
[178] Bennet 2007, 181 recorded the Linear B tablet inventory: From two separate horizons at Knossos (one end of 15th c., other mid-14th c.) total 4,000. Others come from end 13th c.: Pylos (1,100), Thebes (430), Tiryns (24), and Midea (3), 195-8 on varying levels of palatial control; Palaima 2010; Chadwick 1992; 1970.
[179] Bennet 2007, 190, 195; Earle 2002, 83; Killen 1985, 241-3.
[180] Bennet 2007, 200-1.

Tablets from mid-14th century Knossos suggest production targets were determined by a system (Mycenaean *Ta-ra-si-ja*) in which raw wool was measured out to be returned in the same weight of finished goods.[181]

Also missing is evidence, either textually or archaeologically, of a redistribution of palace goods to the non-palatial population for non-durable items such as foodstuffs or textiles. Two alternative explanations to the redistribution thesis have been proposed; one, this was a system of taxation not of redistribution, and, two, it was a system of production for communal feasting activities.[182] These explanations are not mutually exclusive, and plausibly explain practices used in conjunction with one another.[183] The argument for taxation is supported by texts from Pylos which indicated assessments were made for the delivery to the palace of six commodities in a fixed ration to one another; deliveries against those assessments were recorded, and an accounting of any missing contributions with the carry-over quantity still due.[184] Each district was required to deliver each of the six requested commodities without regards for productivity or transport constraints. This suggests the system was more a method of taxation wherein the palaces captured a portion of the items produced. Evidence from seals and sealings that recorded commodity inventories, suggest a precursor to this system existed from Early Minoan II.[185] Linear A tablets add support if the interpretation of the two-syllable words *ku-ro* for 'payment' and *ki-ru* for 'deficit' is correct.[186]

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[181] Bennet 2007, 196-8.
[182] On taxation in general see Killen 1985, 270-2; on feasting Montecchi 2011; Wright 2008.
[183] Borgna 2004.
[184] Bennet 2007, 206 rough cloth (logogram *146) and animal hides (logogram *152) are two of the six commodities, the others are indeterminant; Ma series tablets from Pylos provide the clearest evidence of such a system, Ventris and Chadwick 1956, 289-95; see also Knossos tablets regarding cloth, Ventris and Chadwick 1956, 315-21; Blegen and Rawson 1966.
[185] Nakassis, Galaty, and Parkinson 2010, 242; Younger and Rehak 2008b, 173-4, Fig 1.3.
[186] Younger and Rehak 2008b, 174-7 A few words appear in both Linear A and Linear B which allows the interpretation of about 15 Linear A phonetic values. Translation of Linear A is progressing, see Montecchi 2010.

Redistributive activity may have been evident in communal ritual sacrifice and feasting activities, perhaps sponsored by the palaces as the feasting appears to have occurred both within and adjacent to the palaces.[187] Iconography, archaeological finds of large numbers of consumption vessels, and zooarchaeological data on the number of animals consumed, suggest gatherings in excess of 1,000 people.[188] Notably though, feasting activities consumed less than ten percent of the items catalogued in palatial records, consequently, if the feasting were the source of the distribution activity, clearly the palace populations were retaining a significant portion for their own uses.[189]

As mentioned above, the palaces had been rebuilt following destructions from either natural or human causes, multiple times during the Bronze Age, yet they were not rebuilt after destructions or abandonments of the 12th century. The destruction of the palace system also marked the end of built structures with extensive storage facilities and the loss of written record keeping systems.[190] The Bronze Age palace system with its economic model was not recreated in the Iron Age or Archaic period.

[187] Bennet 2007, 205-6; Palaima 2004; see also Ventris and Chadwick 1956, 303-312 on ritual contributions and month names recorded in Knossos tables; 281-2, Fig. 15 discussion of the painted sarcophagus from Agia Triada.
[188] The Mycenaean palace at Pylos had over 6,500 drinking vessels (kylixes, primarily in rooms 18-22), see Bennet 2007, 199.
[189] Bennet 2007, 206.
[190] Deger-Jalkotzy 2008, 387-8.

## 3.3 Changes in Trade Routes

### 3.3.1 Introduction

Changes in trade routes can have significant consequences.[191] For example, consider the impact the opening of the Suez Canal had. The Middle East became almost overnight an area of geo-political interest to those involved in European–Far East trade whereas ports of call on the route around the bottom of Africa were of reduced importance.[192] Material finds in Aegean Bronze Age contexts, compared with evidence from Iron Age contexts suggest that a change in the major maritime trade routes occurred between the two periods. This section will briefly discuss the Bronze Age Aegean trade routes and, in more detail, the Iron Age trade routes. The change in Aegean trade patterns between the Bronze and Iron ages had significant ramifications for cross-cultural exchange and the introduction of new technologies to the Cyclades.

### 3.3.2 Early Bronze Age

With the development of metallurgy, demand for raw materials from which metal could be produced was created. Mining detritus and slag from smelting operations is observable in the Cyclades at Kythnos in Early Bronze Age levels as well as on other islands (see Fig. 3.4).[193] Cycladic lead, silver, and copper ores were brought to Crete (see Fig. 3.5).[194]

[191] De Bromhead 2018, 72-4.
[192] Karabell 2003.
[193] Renfrew 2011, 308-19; 2010, 289; Bassiakos and Philaniotou 2007, 47.
[194] Gale and Stos-Gale 2008, 387-90, Figs. 37.4a, 37.5, Table 37.2 on Bronze Age Cycladic mineral deposits. In Crete, nearly all metal found up to Middle Minoan period suggests Cycladic or Attic origin ores. Cyprus was also a source. From the Early Cycladic I and II periods, ten percent of the copper finds tested by lead-isotope analysis showed Cypriot origin. By Late Bronze Age this had increased to around forty percent. Cypriot pottery began to increase in Crete from Middle Minoan period, by Late Minoan period Cypriot pottery was found at Gournia, Kato Zakros, Kommos, Malia, and Pseira. Cretan pottery is found in Cyprus as well from this same period. see Betancourt 2008, 215-16, 218; Mee 2008, 375-7; Steel 2010, 807, 813.


***Figure 3.4 Smelting Crucibles. From Syros Archaeological Museum.***

Poros-Katsambas, near Knossos, eventually grew into a metallurgy centre where copper tool casts were found in Early Minoan I and Early Minoan II contexts. Isotope testing of the copper ores indicate that the predominant source of ores was Cycladic.[195] The large quantities of Early Cycladic pottery led Doumas to suggest that itinerant Cycladic craftspeople may have cast tools at the site.[196] Finds of Early Cycladic pottery from the copper smelting installation at Chrysokamino in east-central Crete suggests that both skilled Cycladic metal workers as well as Cycladic sourced ores (confirmed by isotope tests) were present. From graves 10 and 45 at Ayia Photia near Siteia, smelting crucibles were found among the grave goods which also included significant amounts of Cycladic ceramics. The finds from these three areas suggest a strong Cycladic role in Early Bronze Age metallurgy at

[195] Wilson, Day, and Dimopoulou-Rethemiotaki 2008.
[196] Doumas 2010a, 101-3, 90% of the burial pottery was Cycladic Kampos Group style.

multiple sites in Crete.[197] Evidence of Cycladic artisans traveling with Cycladic raw materials will be seen again in the Archaic period marble trade.

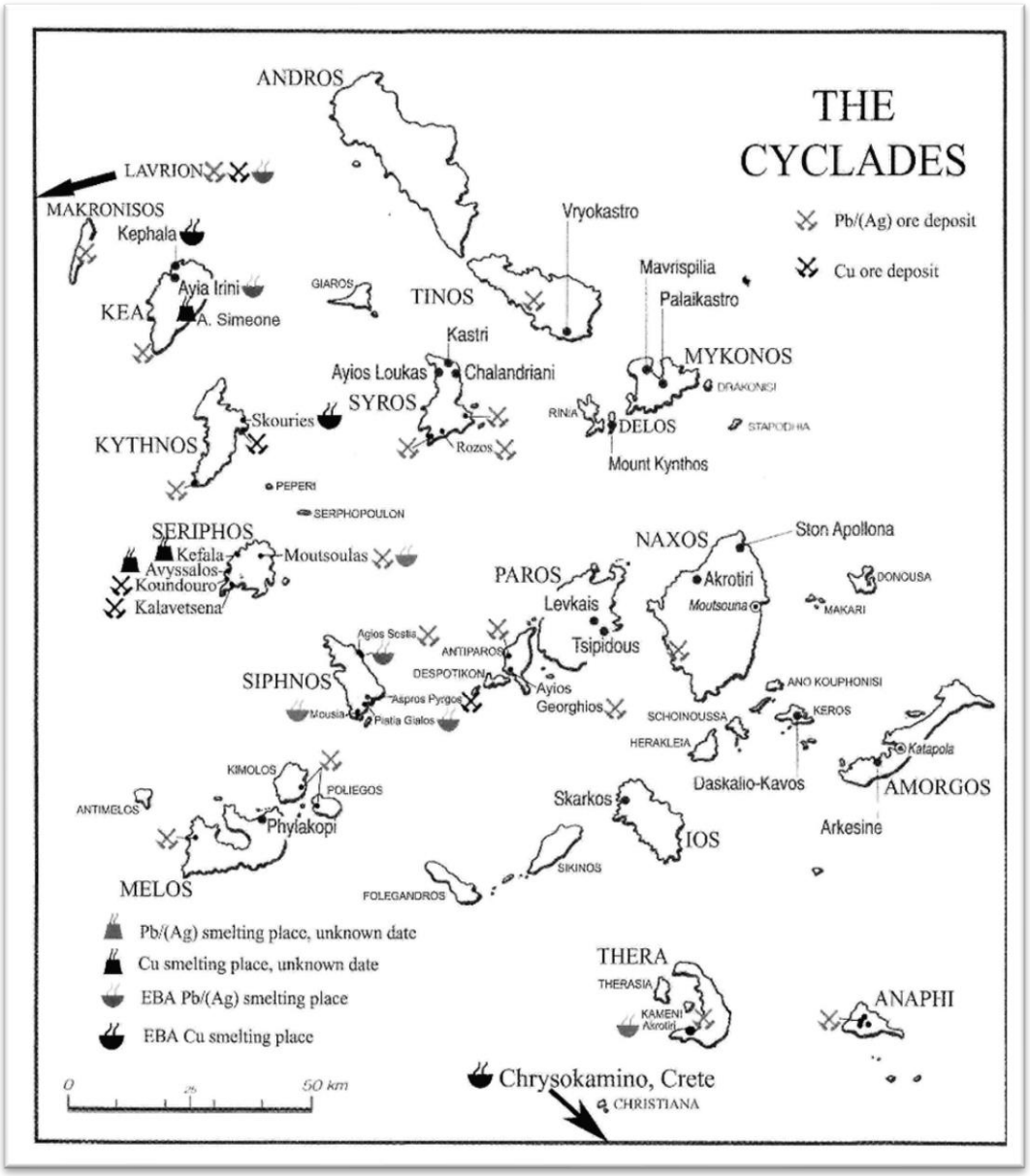


***Figure 3.5 Map of Cycladic Bronze Age Ore Deposits and Remains of Smelting Activities. From Gale and Stos-Gale 2008, Fig. 37.6.***

[197] Davaras and Betancourt 2004, 17-19, 50-1.

Markers of Cycladic contact extends beyond metal ores. Ten iconic Early Cycladic crossed-arms marble figurines of Cycladic origin (confirmed by fabric analysis) have been found in Crete (see Fig. 3.6).[198] Additionally, seventeen copies of these figurines were manufactured in Crete.[199]


***Figure 3.6 Cycladic idols found in Crete at Archanes Phourni, 2300-1700. From Heraklion Archaeological Museum.***

Evidence of reciprocal trade going from Crete to the Cyclades is minimal in the Early Bronze Age.[200] Some Cretan pottery has been found at Akrotiri, Thera from

[198] Renfrew 2011, 199-200; 2010, 289.
[199] Sotirakopoulou and Gavalas 2017, 133-165 discussed finds of five Cycladic figurines, two daggers and a boat-shaped object found near Teke in 1932 with regards to the find's provenance and authenticity. Their conclusion was that, most likely, the collection combined some Cycladic and some Cretan produced items in imitation of Cycladic designs.
[200] Renfrew 2010, 287.

Early Cycladic II contexts.[201] Stone vessels found on Naxos, Amorgos, Syros, Melos, and in larger quantities on Keros, suggest Early Minoan II origin, as they have the same green chlorite schist fabric and decorative style with spiral designs in relief and incised cross-hatching as items found in Crete.[202] Middle Minoan IA Kamares-ware has been found in Phylakopi on Melos in Second City levels and at Ayia Irini on Keos in Period IV levels (both strata dated to Middle Cycladic - 2000-1600).[203] Taken together though, these items seem insufficient to offset the economic costs associated with the flow of mineral raw materials into Crete. Speculatively, the return trade could have been in foodstuffs, textiles, or other materials that did not leave archaeological traces.

Renfrew suggested that perhaps in the Early Cycladic period, the Cycladic islands had a comparative advantage over Crete in water craft, evidenced by the boat designs powered by oars or paddles depicted on the Syros frying pans and the graffiti from Strofilas on Andros, which predate any Minoan depictions of watercraft by 1,000 years (see Fig. 3.7).[204] Actual remains of Early Bronze Age watercraft have not been found, consequently iconography provides what evidence there is.[205] Minoan depictions of sail powered vessels, with a more rounded design than the angular Cycladic designs, and with large sails and rigs similar to those found in Egyptian iconography, appear from the mid-2nd millennium (see Fig. 3.8).[206] The vibrant Akrotiri frescoes found in room five of the west house depict a significant sea voyage carried out under both sail and oar

[201] Doumas 2010a, 103.
[202] Renfrew 2011, 199-200.
[203] Renfrew 2010, 287.
[204] Renfrew 2010, 289; Televantou 2008c, 43-54; See Broodbank 2008, 63-70, Fig. 3.4 for discussion on range of voyages; Casson 1971, 30-5.
[205] Broodbank 2010; 2000; See Casson 1971, illustrations 22, 23, 26, 29 for iconography of these early Cycladic and Cretan crafts, 34-45 Cretan seals with depictions of sailing ship.
[206] Alexiou 2015; Anderson 2010; Casson 1971, 30-5.

power (see Fig. 3.9).[207] The change in maritime technology may have contributed to the change in the communication pattern between the Cyclades and Crete that becomes fully observable in Late Bronze Age contexts.

***Figure 3.7 Syros 'Frying Pan' mid-3rd millennium. Athens Archaeological Museum.***

[207] Davis 2008, 191-2.

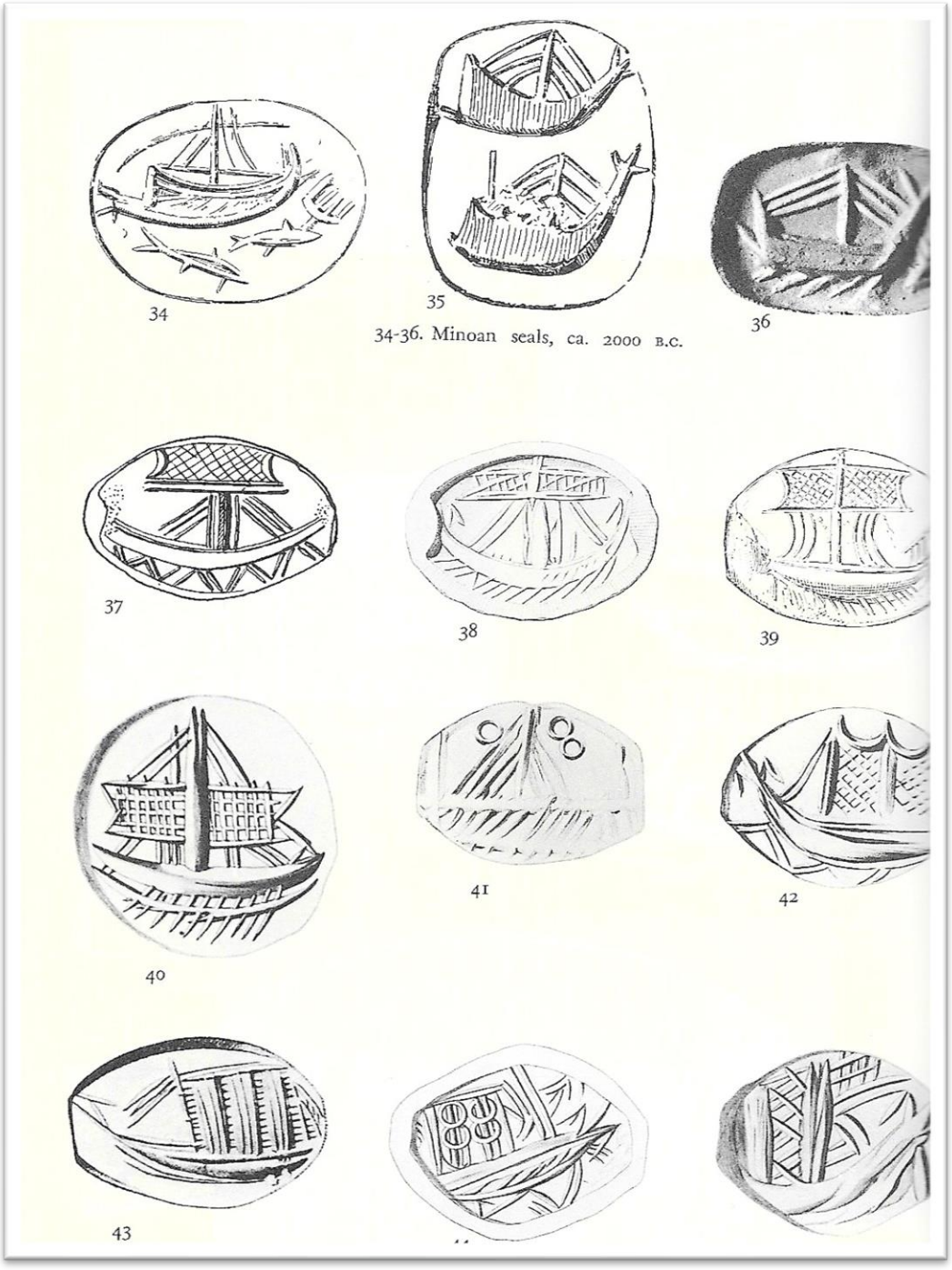


***Figure 3.8 Minoan Seals depicting Sailing Craft, 1600-1200. From Casson 1971, Figs. 34-45.***

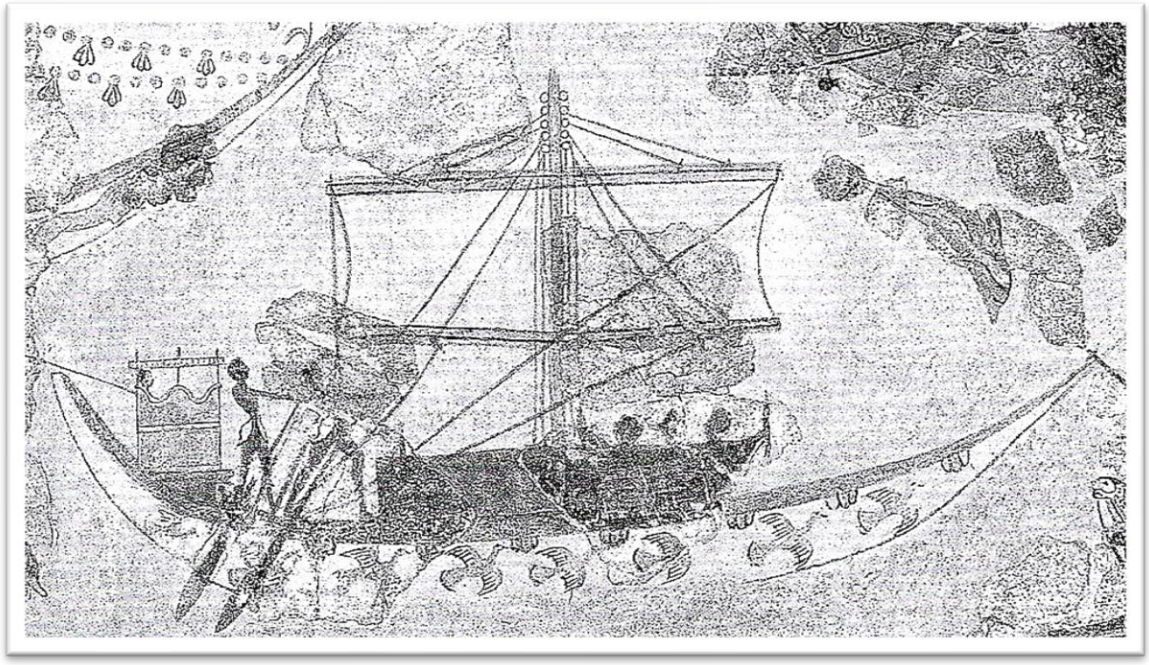

***Figure 3.9 Akrotiri Fresco, mid-2nd millennium. From Broodbank 2013, Fig. 8.22.***

### 3.3.3 Late Bronze Age

A brief examination of Akrotiri, Ayia Irini, and Phylakopi will demonstrate the deep relationship between Crete and the Cyclades in the Late Bronze Age.[208] The first significant finds of Minoan pottery in all three of the aforementioned Cycladic locations are from the Middle Minoan period.[209] Excavations at Akrotiri show the growth of Minoan pottery assemblages from 1% to over 11% between Middle Minoan II and Late Minoan I.[210] Linear A tablets were found at all three locations

[208] Broodbank 2000, 336-49 argued for a general population decline in the Aegean at the end of the Middle Minoan period based on sociopolitical and environmental factors. See discussion in site report on Keos, Chapter 4, section 4.2.2.; see Wiener 2013 and Niemeier 2004 on Minoan naval power; Barber 1981 gave a summary of Late Cycladic Bronze sites and evidence with a useful map of site locations.

[209] Nikolakopoulou 2009, 33.

[210] Nikolakopoulou 2009, 35, 37 the marked increase in ceramics attested the greatly increased level of Minoan involvement in the Cyclades, she described it as more than contact, it was 'affiliation'.

from Late Minoan IA and Minoan clay seals made from local Theran fabric were preserved at Akrotiri.[211] At Akrotiri, 102 lead disc-shaped balance weights and Linear A scripts suggest that the merchants of Akrotiri used the same metrical, numerical, and weight systems as the palace bureaucracy in Crete utilized.[212] The same type of lead weights were found in Crete (36 weights), Melos (3 weights), and Keos (55 weights) suggests a uniform Minoan weight system was used.[213] Architectural features such as ashlar masonry, lustral basins, columnar well lights, and Minoan style frescoes were used for interior decoration at Akrotiri, Phylakopi, and Ayia Irini.[214]

### 3.3.4 Collapse

The palace-based civilizations of the Aegean and Eastern Mediterranean Bronze Age came to an abrupt, and in some cases, violent end, in the late 13th and early 12th centuries.[215] Mainland Greek destructions occurred between 1225-1190 at many of the main Mycenaean centres such as Mycenae, Tiryns, Pylos, Orchomenos, Thebes, Iolkos, and Brauron.[216] Further destruction occurred at Mycenae, Tiryns, and Lefkandi between 1190-1130. Beyond the Aegean, destruction levels are observable at Troy, Miletus, on Cyprus at Enkomi, Sinda,

[211] Doumas 2010b, 758; Davis 2008, 193, 195, 197; Karnava 2008 described the distribution of written materials at Akrotiri, Phylakopi, and Ayia Irini in detail, concluding that Cretan Neopalatial administrative practices were adopted and applied locally based on evidence from the seal fabric and that the writing took place at the Cycladic settlements, not in distant Crete.
[212] Doumas 2010b, 757.
[213] Alberti 2016, 292-99; Caskey 1998, 128, n19; Gale 1998, 738, n12, n13.
[214] Hitchcock 2010a, 189, 194-7 on construction techniques; Davis 2008, 190-3, 196-7 noted that the volcanic stone found at Thera was better suited for ashlar production than the material at Keos. The forms used were imitative of the New Palace architecture (MM IIIA) one of the best examples of which is the Unexplored Mansion at Knossos.
[215] See Cline 2014 for a thorough overview of the recent scholarship on the LBA Collapse; Jung 2010.
[216] Cline 2014, 128; Middleton 2010 has a complete catalog of LBA Greek destructions.

Kition, and Palaeokastro. In Anatolia, the Hittite capital of Hattusa was sacked, as well as Ugarit in northern Syria, and multiple sites in southern Syria.[217]

In the Cyclades and on Crete, the destruction was generally not as severe. Destruction occurred in Crete at Palaikastro[218] and Malia[219] and in the Cyclades at Koukounaries on Paros.[220] More common were site abandonments. In Crete, Kydonia,[221] Agia Triada,[222] Kato Zakros,[223] and Kommos[224] were abandoned as was Grotta on Naxos,[225] and Aghios Andreas on Siphnos.[226] The occupied area of the two major Bronze Age Cycladic sites of Ayia Irini and Phylakopi were much reduced and the sites soon after abandoned.[227]

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[217] Cline 2014, 102-27; Dickinson 2010, 483-90; Drews 1993, 3-30.
[218] MacGillivray and Sackett 2010, 574 reviewed destruction levels at Palaikastro, LMIIIA2 fire destruction level, rebuilding then extensive earthquake damage middle LMIIIB, *c.* 1250, after which the settlement was abandoned. There was evidence of occupation on top of Kastri hill nearly adjacent to Palaikastro LMIIIC, 1200-1100.
[219] Driessen 2010, 556, 567 destruction level at the palace middle LMIIIB, some occupation at Kefali hill (Sissi) until end of LMIIIB. From LMIIIC population limited to upland sites. Malia was never re-inhabited; see also Poursat 2010, 259-67 who suggested the settlement was destroyed *c.* 1250 and abandoned *c.* 1200 with the population moving to refuge sites such as Karphi and Anavlochos in the Lasithi mountains.
[220] Schilardi 2016, 28-33, Figs 63, 64.
[221] Andreadaki-Vlazaki 2010, 526 Kydonia was abandoned in early LMIIIC, almost empty rooms and the absence of signs of destruction suggests that the inhabitants left the coastal location and moved upland.
[222] La Rosa 2010, 505-6 suggested that there is no clear evidence of a destruction level but the floor deposits in Room R test pits suggest the site was abandoned. Votive offerings from LMIIIC and later suggest that the function of the settlement changed to that of an open-air sanctuary at end of 13th c..
[223] Platon 2010, 517 described a general destruction of the palace at the end of LM1B, occupation in part of the settlement until LM111A2 when the site was abandoned.
[224] Shaw and Shaw 2010, 543 Kommos deserted at end of LMIIIB, *c.* 1200. *Circa* 1020 a small temple was established on top of the Minoan ruins.
[225] Deger-Jalkotzy 2008, 387.
[226] Televantou 2008b, 18, 42-3.
[227] Renfrew 1982a, 41-3 Phylakopi IV was in decline in 13th c., sanctuary destroyed perhaps by earthquake *c.* 1120 and the site much reduced until finally abandoned *c.* 1090; Caskey 1971, 397-400 Ayia Irini suffered major destruction from earthquake LHIIIA (1400) and only partially reoccupied thereafter, by LHIIIC seems only the temple area was in use *c.* 1000.

The causes of the collapse are the subject of considerable scholarly research about which there is no clear consensus. Common explanations are (both stand-alone and in various combinations): outside invasion either of marauders or migrating peoples, internal uprising, natural causes including climate change induced drought and suggestions of earthquake swarms, and the implosion of complex societies due to systems collapse wherein the failure of one key component can lead to an overall collapse.[228] An in-depth examination of the causal factors for the end of the Bronze Age is beyond the scope of this thesis. What should be noted, is that the relatively sudden end (about a 100-year period for all areas of the eastern Mediterranean) of Bronze Age societies created a discontinuity in Aegean civilization. As discussed, scholastic opinion covers a range of perceptions regarding just how significant a discontinuity had occurred.[229] Nonetheless, the collapse marked a significant threshold in Aegean civilization.[230] The systems and patterns that preceded the collapse were markedly different in certain aspects, two of which are discussed here - the palace system and trade routes - than what followed.

### 3.3.5 Bronze Age Trade Pattern Summary

The pattern of contact between Crete and the Cyclades changed over the course of the Bronze Age. In the Early Bronze Age, Cycladic islanders brought raw materials, especially metal ores, to Crete. From the Middle Bronze Age, the Minoans expanded northwards through the Cyclades thereby securing raw

[228] See Cline 2014, 139-76; Dickinson 2010, 483-94; 2006, 24-57; Osborne 2009, 35-54; Deger-Jalkotzy 2008, 390-2; Thomas and Conant 1999, 20-31; Drews 1993, 33-93; Woolf 2017, 113-22 framed a discussion on AD 4th c. decline in the Roman world in terms much like the end of the Bronze Age debate.

[229] See Nowicki 1999 on economic life in Crete post-collapse.

[230] Cline 2014, see Editor's Preface by Strauss, xiiv-xiv "Always volatile and frequently dramatic, these [Turning Points} were points at which history took a new direction."

material access more thoroughly.[231] Both Davis and Betancourt identified the heaviest distribution of Minoan finds in the Cyclades and Eastern Aegean along routes associated with metal ores.[232] In the west, the routes ran to Attica and the mines at Lavrion through Keos, Kythnos, Seriphos, Siphnos and Melos, all which had metal resources (see Fig. 3.5).[233] This brief overview demonstrates that the scope of contact between Crete and the Cyclades in the Late Bronze Age was considerable, with the most notable characteristic being directional, in that the Minoans went to the Cyclades, leaving a considerable archaeological footprint behind.

### 3.3.6 Early Iron Age

Dark Age or Early Iron Age? The terminology is reflective of changing opinions regarding continuity of Bronze Age culture through to the Iron Age. Very roughly, scholastic works prior to 1980 refer to the period from 1100 – 800 as a Dark Age, works written after 1980 tend to use the term Iron Age ostensibly to avoid perceptual issues.[234]

Evidence of long-distance trade is conspicuously absent in the centuries following the collapse. Kourou wrote that the only foreign objects in the Aegean in 11th century contexts were Cyprian.[235] Snodgrass noted just two Greek ceramics

[231] Earle 2012 on the Cycladic view of Mycenaean exchange; Wiener 1990, 146 argued that bronze was too important to the Cretans to be left to chance shipments of raw materials, consequently they moved to secure supplies more thoroughly; Gale 1998, 739.
[232] See Betancourt 2008, 216-7; Davis 2008, 200-2 on the western route and 198-9 on the eastern route; See Nikolakopoulou and Knappett 2016; Macdonald, Hallager, and Niemeier 2009 in which articles by Melas, Marketou, Erkanal and Keskin, Momigliano and Niemeier develop the eastern route from Crete through Karpathos and Rhodes to several Asia Minor locations including Miletus; Knappett and Nikolakopoulou 2005 link Crete, Akrotiri and Miletus together from Middle Minoan period; Liverani 2005.
[233] Davis, Schofield, Torrence, and Williams 1983, 361, n2 referred to this as the "Western String" route; Gale 1998, 740, 752.
[234] See Murray 2018; Morris 2007, 211; Dickinson 2006, 5-9; Kotsonas 2016 argues that modern political overtones are embedded in the nomenclature.
[235] Kourou 2008, 364.

datable to the 900s have been found outside of Greece, indicative of the severe degree of contraction.[236] By the Protogeometric period the situation had begun to change. The most inaccessible refuge sites such as Katalimata in Crete were no longer used; plausibly the population moved to more comfortable situations such as Kastro/Azoria (see Appendix C).[237] By the Middle to Late Geometric period, Cycladic settlement sites had increased in number (see Figs 4.133, 4.134).[238] Morris suggested that broad climate change between 850-750 saw the Mediterranean climate shift from a dry sub-Boreal regime to a wetter sub-Atlantic system that created more favourable conditions for agriculture. Taking advantage of a more favourable climate regime, 8th century Greeks intensified and reorganized their agricultural practices resulting in an increase in the food supply.[239]

### 3.3.7 Iron Age Trade Routes

During the Geometric period, probably cognate with Euboean potters, northern Cycladic islanders developed a thin-walled pendent skyphos with concentric semi-circle designs (see Figs. 3.10, 3.13).[240] This skyphos design has been found over a wide area of the eastern Mediterranean and into the west allowing renewed trade to be traced, predominately in an east-west distribution.[241]

[236] Snodgrass 1980, 15, 55.
[237] Nowicki 2000, 157-70 (Lasithi), 92-100 (Kavousi). Survey work supports these diachronic observations; see Haggis 1996 (Kavousi); Watrous *et al.* 1993 (Western Mesara); Hayden, Moody, and Rackham 1992 (Vrokastro); Nixon, Moody, and Rackham 1988 and Moody, Nixon, Price and Rackman 1998 (Sphakia).
[238] See also Mazarakis Ainian and Leventi 2013, 213.
[239] Morris 2013, 66-7, 70; Snodgrass 1980, 15-84.
[240] Coldstream 2003, Fig. 8, items a, b; Fig. 9, item g; Fig. 18, item h, are photos of skyphoi from Euboea (Lefkandi Skoubris cemetery, grave 33), Marmariani in Thessaly opposite the northern end of Euboea, and Tenos. Discussion on p. 40; Kearsley 1989, 1-4 and catalog of skyphoi.
[241] Fletcher 2012; Kuhrt 2002; Boardman 1996, 157.

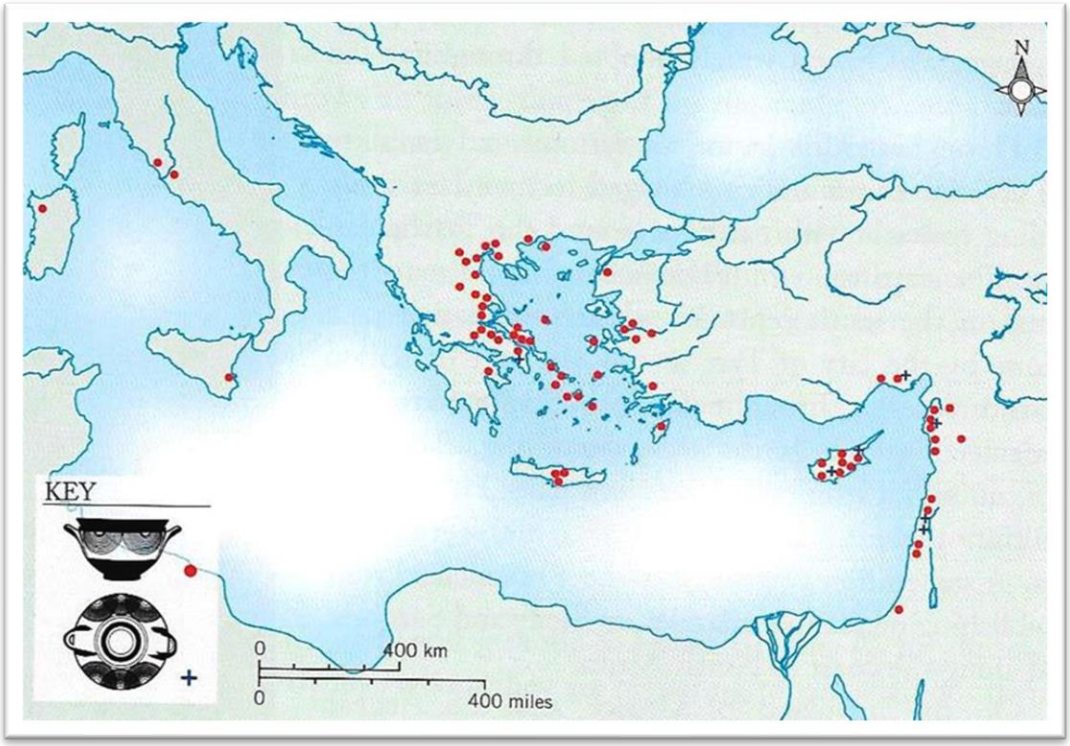


***Figure 3.10 Distribution of two semi-circle pendent skyphoi. From Popham, Pollard, and Hatcher 1983, Fig. 2.12.***

The Orontes river in northern Syria provided the shortest route (coupled with a caravan portage east to Carchemish on the Euphrates river) from the Mediterranean coast to upper Mesopotamia, from where deeper inland contact was a possibility (see Fig. 3.12).[242] Al Mina, situated at the mouth of the river, provided a good anchorage. The river cut through two significant mountain ranges.[243] The earliest Greek pottery at Al Mina was Cycladic, dated perhaps to 10th but certainly the 9th century (level X) followed slightly later by Euboean.[244]

[242] Pamir 2006, 536, 538; Hodos 2006, 32; Boardman 1990, 176; Braun 1982, 9-11.
[243] Boardman 2006a, 513; 1999b, 154.
[244] Vacek 2017, 49; Boardman 1996, 157; Hodos 2006, 37-8, n16 discussed the uncertainty of the foundation date for the settlement.

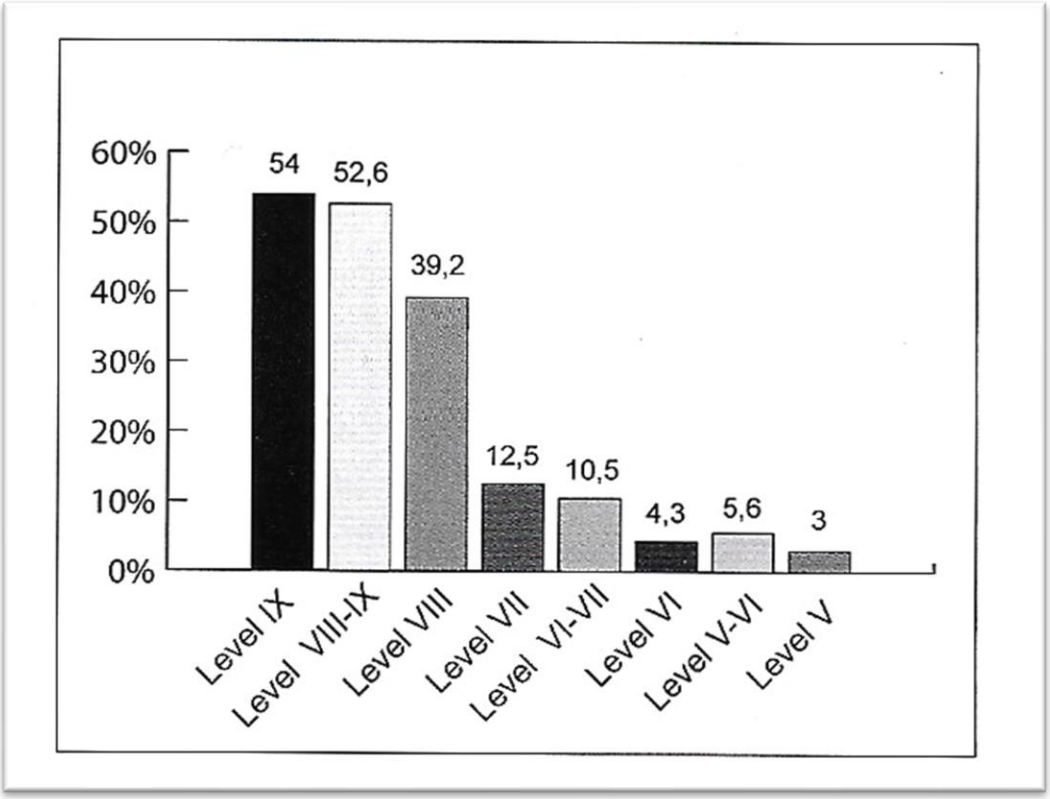


***Figure 3.11 Distribution of Euboean sherds at Al Mina per level. From Vacek 2017, Fig. 7.1.***

Expansion of Euboean and Cycladic contacts within the region followed; *c.* 800, from domestic contexts, Euboean and Cycladic sherds were found inland, further along the Orontes at Hamath and Tell Abu Hawan in Canaan.[245] Throughout the 8th century, Greek finds from Al Mina increased in frequency.[246] In the port area of Al Mina 1,500 imported Geometric period Greek ceramics have been recorded, in the immediate hinterland approximately 200 more, and in the rest of the Levant an additional 190.[247] The widest-area distribution of finds were Early and Middle Geometric (850-750), while the greatest quantity of imports was Late Geometric

[245] Hodos 2006, 33-5; Luke 2003, Table 8 distribution of Greek finds across the Levant excepting Al Mina. Cycladic finds of skyphoi and a plate seem concentrated at Ras el Basait, a coastal site 25 km south of Al Mina.
[246] Braun 1982, 7-9.
[247] Luke 2003, 20, 44.

(750-700). Euboean imports to Al Mina are not found after *c.* 700, seemingly taken over by Corinthian, East Greek, and later, Attic (see Fig. 3.11).[248] In the Cyclades, Euboean ceramic goods have been found mostly on Andros and Naxos, while Corinthian and Attic goods have been found on nearly all islands.[249] No imports of Geometric ceramics from Crete have been found at Al Mina or vicinity, though there have been some found on Cyprus in burial and sanctuary contexts.[250]

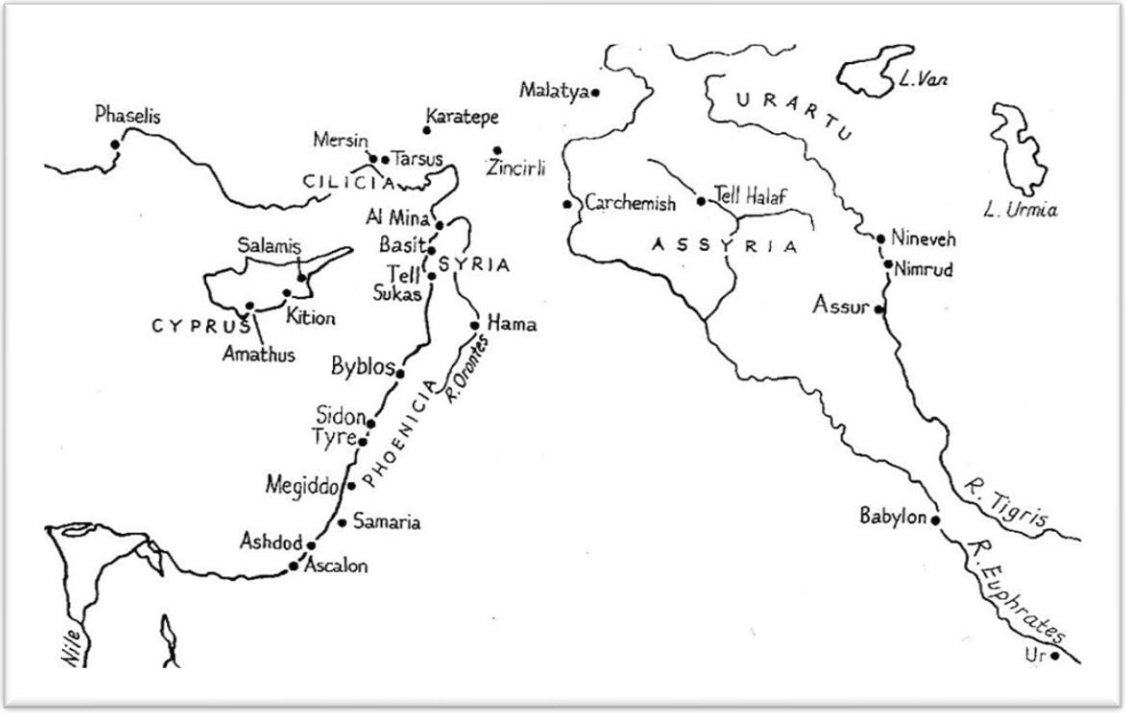


***Figure 3.12 Map of Near East. From Boardman 1999a, 34.***

[248] Luke 2003, 60.
[249] Boardman 1996, 155-6; on Andros see Cambitoglou, Birchall, Coulton, and Green 1988, 241; on Naxos see Charalambidou, Kiriatzi, and Müller 2017, 113, 116; Kourou 2015, 89, 91-2.
[250] Luke 2003, 58; on Cyprus see Luke 2003, 42, 44; Popham, Pollard, and Hatcher 1983, 288.

***Figure 3.13 Skyphos. From Naxos Archaeological Museum.***

Shapes associated with drinking or feasting were the most common Greek ceramics found both in the port area, the hinterland, and throughout the Levant.[251] Two possible explanations for this pattern have been put forth. First, it suggests that the cups may have been utilized in a gift-exchange protocol.[252] Feasting activities as a way of initiating or stimulating trade was a common Near Eastern practice, both at a high societal level and at commercial levels of trade maintenance.[253] Finds of Near Eastern items in burials at Lefkandi support this interpretation if considered as reciprocal gifts. Second, the decorated thin-walled skyphos is evidence that Greeks were resident at Al Mina as the skyphos was the traditional Greek drinking shape during the Geometric period, whereas the customary Near Eastern drinking cup design was handle-less with a rounded bottom.[254] The explanations of gift exchange and Greek residency do not seem

[251] Luke 2003, 26, Table 10.
[252] Luke 2003, 50-2; Ridgway 1997, 339; Boardman 1996, 157.
[253] Luke 2003, 47-53, Plate 3 Assyrian banquet.
[254] Boardman 2006a, 514; 2002, 7-10; 1996, 157; Hodos 2006, 61-2 argued that Near Easterners would have been interested in Greek drinking shapes.

mutually exclusive; elements of gift-exchange and personal use could plausibly exist in concert.[255] Gift exchange as a trade protocol is discussed further in Appendix E.

Architectural evidence at Al Mina of building forms and contents are indicative of mixed warehousing and residential usage.[256] In the Geometric period, buildings at Al Mina were constructed with wall thicknesses of 70 cm, continuous foundations, and no evidence of wood timber reinforcing. Building construction method evidence from Lefkandi is different; walls are 40 cm thick, reinforced with wooden timbers and foundations stop at doorways.[257] This suggests that the Greeks present at Al Mina utilized Levantine buildings for living and warehousing needs rather than building their own style of building.[258]

The finds of Greek pottery at Al Mina were considerably more plentiful than at other Levantine sites (see Fig. 3.14).[259] Beyond Al Mina, non-Greek wares were by far the majority of the ceramics.[260] At Al Mina, the percentage of non-Greek pottery increases after the establishment of the trading centre. In level IX (9th century), as much as 78% of the finds are Greek. By level VIII and VII (the 8th century) the non-Greek finds increase to about 50%.[261] The non-Greek ware was 31.9% Cypriot and Levantine and 20.6% Syrian Red-Slip ware.[262] The distribution of Greek pottery in the hinterland immediately east of Al Mina seems to have been

[255] Boardman 1999a, 40 seems to concur with the trading nature of the relationship between the Greeks and the various Asiatic groups.
[256] Boardman 1999a, 39-50 on stratigraphic phases of Al Mina. Phases X-VII late 900s through 800s. Phases VI-V cover the 700s.
[257] Luke 2003, 23, Figs. 2, 3, 4, 5 site layout phases reproduced from Wooley 1938; Boardman 1999b, 150.
[258] Hodos 2006, 40 Al Mina building architecture was the same as other at other Levantine sites such as Kinet, Höyük, and Tarsus.
[259] Boardman 2006a, 515; 1990, 170-176, Table 1.
[260] Boardman 1990, 172-3, 176, 183.
[261] Boardman 1999b, 150; Kearsley 1999, 130.
[262] Boardman 1999b, 151.

restricted to just three sites, tiered by settlement size; the most plentiful finds were at the largest city of Tell Tayinal, second most at the second largest city of Chatal Hüyük, and the third most at the third largest city Tell Judaidah.[263]

| Greek Pottery Proportions at some Eastern Sites | | | | |
|---|---|---|---|---|
| SITE | AREA EXCAVATED IN SQ. M. | GREEK POTTERY ITEMS | GREEK ITEMS PER SQ. M.* | GREEK % OF ALL |
| Tarsus | 660 | 70 | 0.1 | 2? |
| Al Mina | 2300 | 1500 | 0.65 | 47 |
| Ras el-Bassit | 900 | 25? | 0.03? | ?< 3 |
| Tell Sukas | 425 | 14 | 0.03 | ?< 5 |
| Tyre | 150 | 31 | 0.21 | 0.13 |
| * 'decorated and diagnostic' pottery at Tyre; kept pottery at Al Mina | | | | |

***Figure 3.14 Greek Pottery Proportions. From Boardman 2006a, 515.***

After 700, the Greek sources of ceramics recovered at Al Mina changed (see Figs. 3.11, 3.15). From level VII (700-670), the percentage of Euboean pottery dropped to *c.* 12% and under 6% in levels IV and V.[264] Corinthian and Attic imports had been a small fraction of the imports prior to 700, not more than 3% combined in levels IX to VIII.[265] Throughout the 7th century (levels VII-V), Corinthian ceramics increased to 10-11% of all imports.[266] Eastern Greek (Ionian coastal cities such as Miletus and major islands Chios and Samos) finds dominate the assemblages after

[263] Luke 2003, 20; Hodos 2006, 39.
[264] Vacek 2017, 50, Fig. 7.1.
[265] Vacek 2017, 49.
[266] Vacek 2017, 54, Fig. 7.13; Boardman 2006a, 521.

the mid-7th century. From the end of the 7th century, Greek imports to Al Mina declined (see Figs 3.11, 3.15). After 580, Greek ceramics are no longer found.[267]

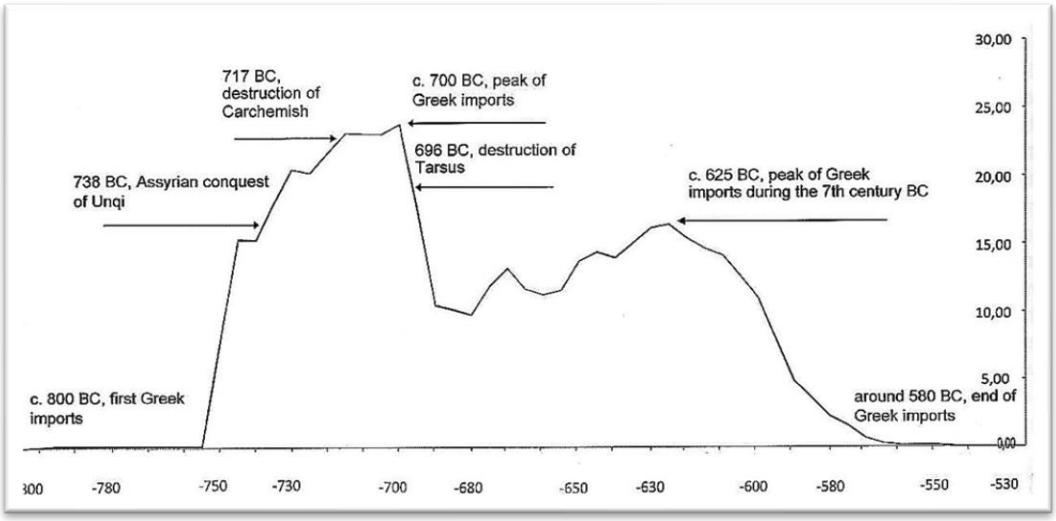


***Figure 3.15 Kernel Density Estimate of Dated Sherds from Al Mina. From Vacek 2017, Fig. 7.3.***

Prior to 738, the evidence from written Assyrian records suggests that the Amug plain was under the control of the neo-Aramaean kingdom of Unqi.[268] The Arameans comprised a loose affiliation of kinship-oriented urban settlements.[269] In 738, an Assyrian governor took direct control of the region.[270] Inscribed on a stele of Tiglath-pileser III was "Ahta, the karum at the sea shore." A 'karum' was a specially designated economic area under the control of royal Assyrian

[267] Vacek 2017, Fig. 7.3.
[268] Luckenbill, 1926, *Ancient Written Records of Assyria and Babylonia, Volume 1,* §769, University of Chicago; Hodos 2006, 30-3 discussed Aramean settlement territories and Assyrian interest in the region.
[269] Hodos 2006, 29. Aramaic was a new language of the 1st millennium traced from 2nd millennium Semitic languages, particularly Canaanite.
[270] There are suggestions in Assyrian written accounts of conflict with 'Ionians' in Syria and southern Anatolia during late 8th c.. See Boardman 2002, 3; Kearsley 1999, 119-22; see Grayson 1993a, 71-7 on re-assertion of Assyrian power under Tiglath-pileser III.

representatives.[271] This suggests, if Luke's interpretation that Ahta was Al Mina is correct, that upon taking over direct control of Al Mina, the Assyrians established Al Mina as a formalized trading post.[272]

The pottery distribution at Al Mina suggests it was a meeting place of seafaring Greeks and Phoenicians as well as inland Aramaeans and Assyrians.[273] Those people who had access to this control point would not only have had access for trade purposes, but access as well to an array of other cultures, ideas, technologies, and methodologies of exchange.[274] Boardman noted that the pre-700 Greek finds were dominated by Euboean and Cycladic wares.[275] If direct Greek contact with Asia during the Late Geometric period was restricted to these entrepreneurial Aegean islanders, the trade and cultural exchanges may have been significant in the social and economic developments in those communities that had such contacts.[276]

For the inhabitants of the Cyclades the shift from Euboean to Corinthian finds after 700 was potentially significant. The change from more northerly Euboea to Corinth as the mainland destination port would plausibly engender an adjustment to the sailing routes through the Cyclades (see Fig. 3.18). Concomitant with such a shift, would be a diffusion of the benefits of contact with other island groups that previously may not have been involved with this trade route.[277]

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[271] Fantalkin 2006, 202; Luke 2003, 11-12, 21.
[272] Luke 2003, 20-3.
[273] Boardman 1990, 176-83; see Monroe 2018 on Phoenician activity.
[274] Boardman 1999b, 150-1 At Al Mina, in levels X-VII, 31.9% of the pottery was Cypriot or Cypro-Levantine and 20.6% Syrian red-slip; Sommers 2009 on Phoenicians.
[275] Boardman 1996, 157; Cycladic-ware was not voluminous compared to Euboean (about 8% of Euboean volume), but was continuously present at all levels, see Vacek 2017, 49, Figs 7.2, 7.4.
[276] Vlassopoulos 2007, 177 considered the full range of possible contact significant "the mercenary, the trader, the craftsman, the doctor…"
[277] Papadopoulos 1997 argued just this point, the Euboean/Al Mina trade should be viewed in a wider Mediterranean context wherein the participation and benefits from a trade route were more widely felt; Craik 1980, 3.

There is evidence, albeit speculative, that lends support to this interpretation. On the Cycladic island of Despotiko, near Paros, is an Archaic period sanctuary and settlement (discussed in section 4.3.2.2).[278] Carefully arranged and preserved under floor paving stones in temple building A1, was a collection of small items from earlier cultic activities at the site.[279] In this deposit, the largest group of imported ceramics are Corinthian, dated to 7th and first half of 6th centuries (see Fig. 3.16).[280] These Corinthian imports (mainly aryballoi and alabastra) date to the same period as the increase in Corinthian material at Al Mina. Also found in the deposit are ivory fibulae and disks, as well as simple beads made of glass, stone, and faience, possibly of Syrian or Phoenician fabrication. The origin of these items has not been established beyond typology.[281] The inclusion of the Corinthian and potential Near Eastern items in a temple-foundation deposit suggests something more than simple trade goods. These items could plausibly be related to a development of greater significance, such as an important trade route coming through the anchorage of Despotiko.[282] Corinthian pottery at Despotiko continued in subsequent strata dated after the temple-foundation deposits (see Fig. 3.17).

[278] Kourayos, Daifa, Ohnesorg, and Papajanni 2012, 93-104, Figs 4, 7.
[279] Kourayos and Burns 2017, 327, Fig. 1.
[280] Kourayos and Burns 2017, 330, Fig. 7; Kourayos, Daifa, Ohnesorg, and Papajanni 2012, 124-7, Fig. 37.
[281] Kourayos and Burns 2017, 331-2, Figs 10, 11.
[282] Vacek 2017, 58 suggested that changing tastes in the pottery buying habits of Levantine buyers was behind the shift from Euboean to Corinthian items; Luke 2003, 47 noted that by the 6th c. Greek drinking cups had been replaced by locally produced bowls using red slip technique along the length of the Syrian coast, reflective of changes in market demand; For this discussion, it is the adjustments to sailing routes through the Cyclades that is of greatest importance; See Arnaud 2011, 63-7 on port dues and trading regulations. Ships coming into harbor were subject to two types of tax, *ellimenion* probably for services and *tele emporika* a state tax. Aristotle *Oeconomica 2.1-6* considered this tax the second highest revenue source for the state. Additional taxes could be levied on the goods traded. It is unclear when this practice started but the restricted nature of access to Al Mina, especially after 738 when Assyrian control was asserted, suggests access was regulated and plausibly came at a cost.

***Figure 3.16 Despotiko Room A1 Floor Deposit. From Paros Archaeological Museum.***

***Figure 3.17 Despotiko, Proto-Corinthian and Early Corinthian finds, 650-600. Paros Archaeological Museum.***

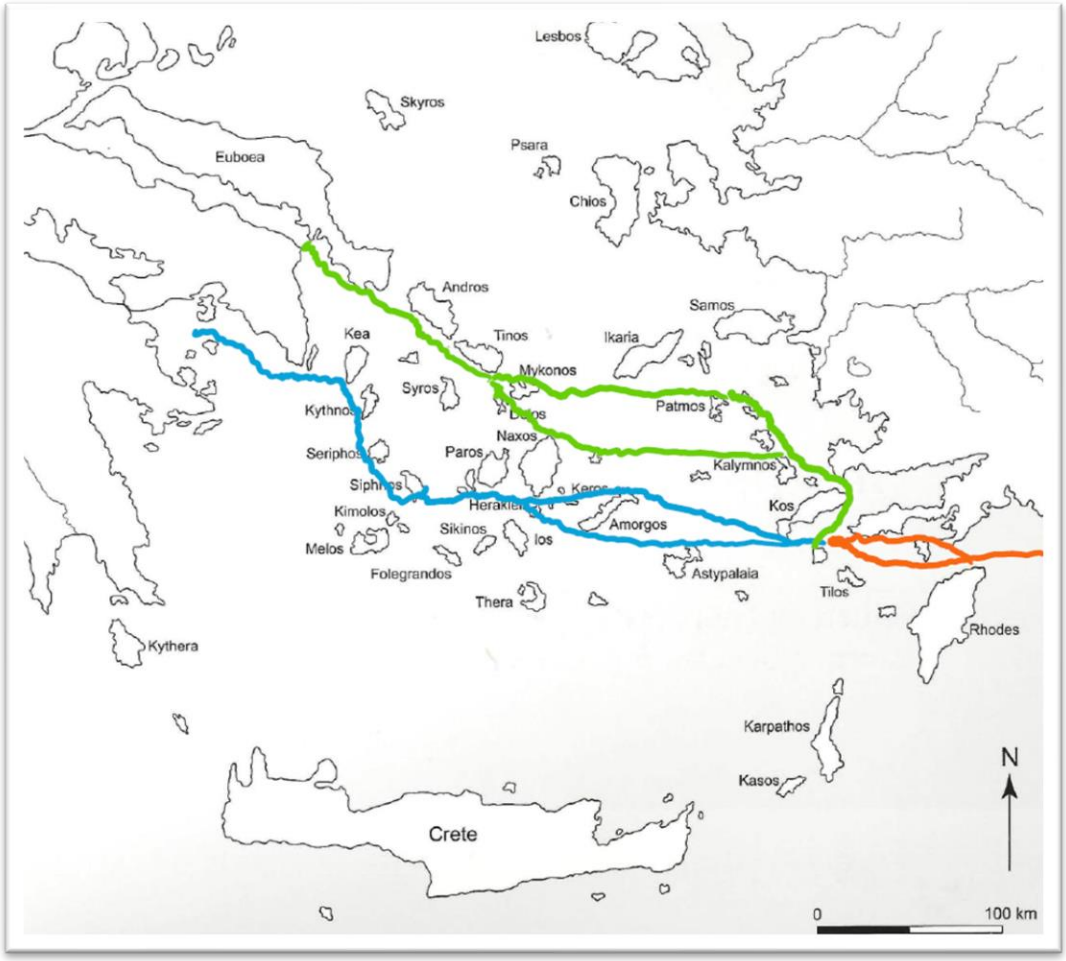


***Figure 3.18 Chart of Possible Sailing Routes through the Cyclades, Base chart from Horizon 2008, front piece, author's annotation of routes.***

The green line represents the most probable route between Euboea and the Carian coast. For the Saronic Gulf, the southerly blue route is suggested. Between Al Mina and Rhodes there is only one possibility, the red line along the Carian coast. The east to west route goes into the prevailing summer wind, blowing from the west departing Al Mina, turning north-west at Rhodes and out of the north in

the Aegean. The west to east route goes with the prevailing wind at the vessel's rear or over the port side, considerably easier and faster.[283]

Two other places where Early Iron Age trade contact occurred between Greeks and others were Naucratis in Egypt and Pithekoussai near modern Naples in Italy. Naucratis was established on the Canopic branch of the Nile at a slightly later period than Al Mina.[284] The earliest Greek pottery is Corinthian 630-620. The earliest scarabs recovered date to the reign of Psammetichos II (595-585).[285] At Naucratis, the architecture is Greek, with temples to Hera, Aphrodite, Apollo, and the Dioscuri. Manufacturing facilities for items destined for local sale and export to other markets are evident.[286] A faience scarab seal factory next to the temple to Aphrodite has been excavated. Alabaster statuettes suggest local manufacture from their fabric as do faience flasks with the names of Egyptian kings on them.[287] The settlement was allowed by the authority of the Egyptian King and was not a colony or a Greek town but rather a collective Greek trading station.[288] Herodotus recorded that the Greeks were given the city by the Egyptian King Amasis and were allowed to visit and erect altars, but not to settle. According to Herodotus (2.178-9), Naucratis was the sole point of entry and trading post in Egypt for foreigners. It was a mandatory first port of call and if by accident your ship entered another

[283] Casson 1971, 270-96 is still the best summary of ancient sailing routes; see also Beresford 2013; Sauvage 2012; Arnaud 2011; Boardman 2001, 2. These works are general in nature and do not give port to port information of precise routings. The trans-Cycladic routes presented above are from the author's personal experience of seven years sailing in the Aegean; On shipwrecks see Throckmorton 1987; For piracy along the Carian coast see De Souza 1999, 15-26.
[284] *OCD* 4th ed. 2012, 1001 credits founding to reign of Psammetichus I (664-610).
[285] Boardman 1999a, 118-22.
[286] Boardman 1999a 130 suggested that each Greek city had its own temple and warehouse in an independent zone within the overall controlled settlement. Access to the temples was common and not reserved just for that city's representatives; Bresson 2016, 355 suggests that the site was selected for its access to nearby natron beds which Greeks utilized in woolen textile dying.
[287] Boardman 1999a, 126-8.
[288] Boardman 1999a, 130-1.

channel of the Nile, the goods had to be transported to Naucratis by barge for clearance.[289]

The 8th century Euboean settlement at Pithekoussai, on the island of Ischia, opposite Cumae, Italy, provides a contrast to these port of trade examples. Pithekoussai was situated on a defensive peninsula, adjacent to good agricultural lands, with an acropolis at Monte di Vico, and a cemetery in adjacent Valle San Montano.[290] The settlement stretched along the peninsula for over one km.[291] The earliest pottery dates to *c.* 770 and consisted of the pendent-semi cup and skyphos shapes as found at Al Mina (see Fig. 3.13). Euboean presence continued until *c.* 700 after which Euboean materials were no longer evident (a pattern similar to Al Mina). Habitation continued thereafter.[292] Locally made ceramic vessels were produced in Euboean styles. Three notable items were: a cup with the artist's signature ("…inos made me") the first known example of an artist's attestation; Nestor's cup with a long, incised verse on it; and a Late Geometric vase with a graphic drawing of a shipwreck with bodies floating among the fish, suggesting that not all sea voyages ended well.[293] One locally made vessel was inscribed in Aramaic and another in Phoenician.[294] The mixture of languages preserved on pottery suggests this was a place of exchange. There are traces of metal working at both Mezzavia and Monte di Vico where iron slag and the mouth-piece of a

[289] A case can be made that Naucratis was under greater Egyptian control than Al Mina was under either Unqi or Assyrian authority and could perhaps be more properly termed an *emporium* than a port of trade. See Arnaud 2011, 65; Herman Hansen 2006b. It seems though, that there is not enough evidence to clearly establish the degree of control of the port area, consequently the term port of trade seems valid.
[290] Boardman 1999a, 165.
[291] Coldstream 2004, 50-1, Fig. 4.1.
[292] Boardman 1999a, 165.
[293] Boardman 1999a, 166-7, Fig. 204 cup *c.* 700, Fig. 205 Nestor's Cup from Rhodes, Fig. 203 shipwreck. Nestor cup inscription: "Nestor has a most drink-worthy cup, but whoever drinks of mine will straightaway be smitten with Aphrodite." Ridgway 2004, 42 described this as the first Greek writing worth reading.
[294] Boardman 1999a, 166.

bellows were found.[295] There is no evidence on the island of a hinterland authority, rather the Euboeans established Pithekoussai as a true *polis* and utilized the whole island as its *chora*.[296] Pithekoussai was a different model than either Al Mina or Naucratis were.

Additive to this discussion, is how did ships conduct water borne trade; did ships travel directly from the beginning to end of their journey in a single continuous movement, or did they call at multiple ports along the route, trading at each stop – a practice referred to as tramping.[297] The ancient sources are mixed on this topic. Herodotus (4.196) described a beach trade wherein a ship would stop on a beach and trade goods with the local population, then move on. Strabo related a story attributed to Eratosthenes, that ancient sailors, whether on a piratical excursion or commercial, never ventured onto the high seas but crept along the coast.[298] Homer, however, had Calypso teach Odysseus to build a new ship in the style of merchantmen designed to sail at night, consulting the stars, far from visible land, and, in another passage, contrasted the sailing capabilities of the Achaeans with the new merchant ships designed to sail across the wide gulf of the sea.[299] The terms cabotage and tramping are often used in conjunction, but to do so is incorrect.[300] Originally, cabotage meant sailing from cape to cape (as opposed to open-water transit away from land), whereas tramping refers to a method of cargo handling. Arnaud presented near-shore and open-water as separate models. In reality, direct open-water voyaging, cabotage, and tramping could have been

[295] Coldstream 2004, 51; Boardman 1999a, 167, Fig. 207.
[296] Domínguez 2011 discussed structural variations around theme of colonization; Vlassopoulos 2007, 177 considered colonization just another form of mobility; for traditional interpretation see Coldstream 2004, 51; Ridgway 2004, 36.
[297] Arnaud 2011, 61 presented these two concepts as different models that he then attempts to validate through an examination of laws and treaties from the Classical and Hellenistic periods.
[298] Strabo *Geographica* Book I, C48; Loeb 49, 176-7.
[299] Homer, *Ody.* 5.248-78 οὐδέ οἱ ὕπνος ἐπὶ βλεφάροισιν ἔπιπτεν Πληιάδας; 9.320-25. ἥ τ' ἐκπεράᾳ μέγα λαῖτμα.
[300] Arnaud 2011, 61-2.

employed as a unitary construct to deal with different wind directions.[301] Open-water transits would be possible when sailing with the prevailing winds, keeping distant from navigational hazards. Cabotage is more descriptive of actual practice when sailing against the wind. When the weather turns foul and forward progress is not possible, it makes sense to seek shelter and wait until conditions change.[302] In this interpretation, direct voyages occurred from Euboea to Al Mina on the long run with the prevailing winds, and return voyages from Al Mina to Euboea made stops and trades while working back against the prevailing winds.

### 3.3.8 Near Eastern Imports

To understand the full scope of the east-west trade it is necessary to consider Near Eastern items found in Greek contexts. As mentioned, Near Eastern finds are few and far between in the difficult 11th and 10th centuries. Kourou noted the complete absence of any Near Eastern finds in Greece other that from Cyprus in the 11th century.[303] A bronze bowl of uncertain date of manufacture from Cyprus was found in an 11th century burial on Saronic Salamis.[304] Eleventh century Cypriot material was found in Crete at Knossos and Rethymon. From grave 201 of the North Cemetery of Knossos, a fragmentary four-sided decorated bronze stand was uncovered.[305] Excavations of a tholos tomb excavated at Amari near Rethymon, produced a bronze amphoroid krater, an iron knife, a bronze fibula, a pin, and black-painted vase very similar to Cypriot black-slip ware.[306]

[301] See Forsyth, forthcoming.
[302] Beresford 2016, 163-6; Sauvage 2012, 274-8; Casson 1971, 273-8.
[303] Kourou 2008, 364.
[304] Kourou 2008, 362-3, Fig. 1. It is difficult to determine the precise provenance of this bowl, it could be an 11th c. import associated with a refuge site on the north end of Salamis or it could be an heirloom from a LBA settlement at Kanakia on the southern end of Salamis, deposited in an 11th c. grave. Other Cypriot origin items were found in 13th c. levels at Kanakia.
[305] Kourou 2008, 363. Whether this item too is an heirloom, or a fresh import is unclear, similar Cypriot bronze stands have been found in 11th c. contexts in Sardinia.
[306] Kourou 2008, 363-4, Fig. 2.

In the 10th century, a gradual increase in Near Eastern finds can be observed, most prominently at Lefkandi and Knossos.[307] The earliest post-Mycenaean Near Eastern import at Lefkandi, was a dipper juglet from grave S.46 in the Skoubris cemetery dated to Early-Protogeometric period, *c.* 1000-950.[308] A 10th century Near Eastern faience necklace and some beads of blue faience were recovered from grave P.25B. From the mid-10th century, the imported material found in burial contexts increased markedly. Nearly every grave contained faience, vases, bronze bowls, jugs, and mace heads, originating in Near East, Cyprus, and Egypt.[309] The most opulent grave goods came from the Heroon, a large apsidal building adjacent to the Toumba cemetery (see Fig. 3.20).[310] The building was built over two shaft graves both dated to the 10th century.[311] One containing the ashes of a man deposited in a bronze amphorae of similar type to that found at Amari in Crete (mentioned above), accompanied by gold ornaments.[312] The adjacent shaft contained a female inhumation found with many gold ornaments including an heirloom gold pendent necklace dated to the Old Babylonian period, *c.* 1700.[313] Kourou and Popham both suggested that the gold was worked in styles and techniques cognate with Near Eastern gold working practices. Two bronze bowls engraved with heraldic griffins and an elaborate palmette were found at Toumba

[307] Hodos 2006, 37; see Antoniadis 2017, 69-90 for a complete catalog of Iron Age imports in mortuary contexts at Knossos; Murray 2017, 96 most of the imports at Lefkandi come from LPG or SPG contexts, not EPG or MPG.
[308] Demand 2011, 226; Kourou 2008, 364, Fig. 3; Luke 2003, 56-57; Lemos 1996, 122; Popham, Sackett, and Themelis 1980, 126, Plates 86, 106, 270b.
[309] Kourou 2008, 365; Popham 1995; Popham, Sackett, and Themelis 1980, 223-4 (faience), 249-50 (bronze jugs), Plate 93; Kearsley 1999, 125-6 suggested that the opulent Near Eastern items in warrior graves at Toumba were payments received for mercenary service fighting for Near Eastern kings, perhaps in conflict with Assyrian expansion to the western coast of Syria, p. 120; see Boardman 2006a, 519-20 on military conflict between Ionians and Assyrians *c.* 740-700.
[310] Demand 2011, 227; Osborne 2009, 55-8, Fig. 12; Popham 2004, 12-26; Morris 2000, 218-20; Mazarakis Ainian 1997, 48-58, Figs 82, 90, 91, 93a-c.
[311] Kourou 2008, 365; Popham 2004, 15, Fig. 2.3.
[312] Murray 2017, 95; Popham and Lemos 1995.
[313] Murray 2017, 95.

(see Fig. 3.19). The friezes are badly corroded and, while Popham considered the designs suggest Syrian origin, this is not certain.[314]

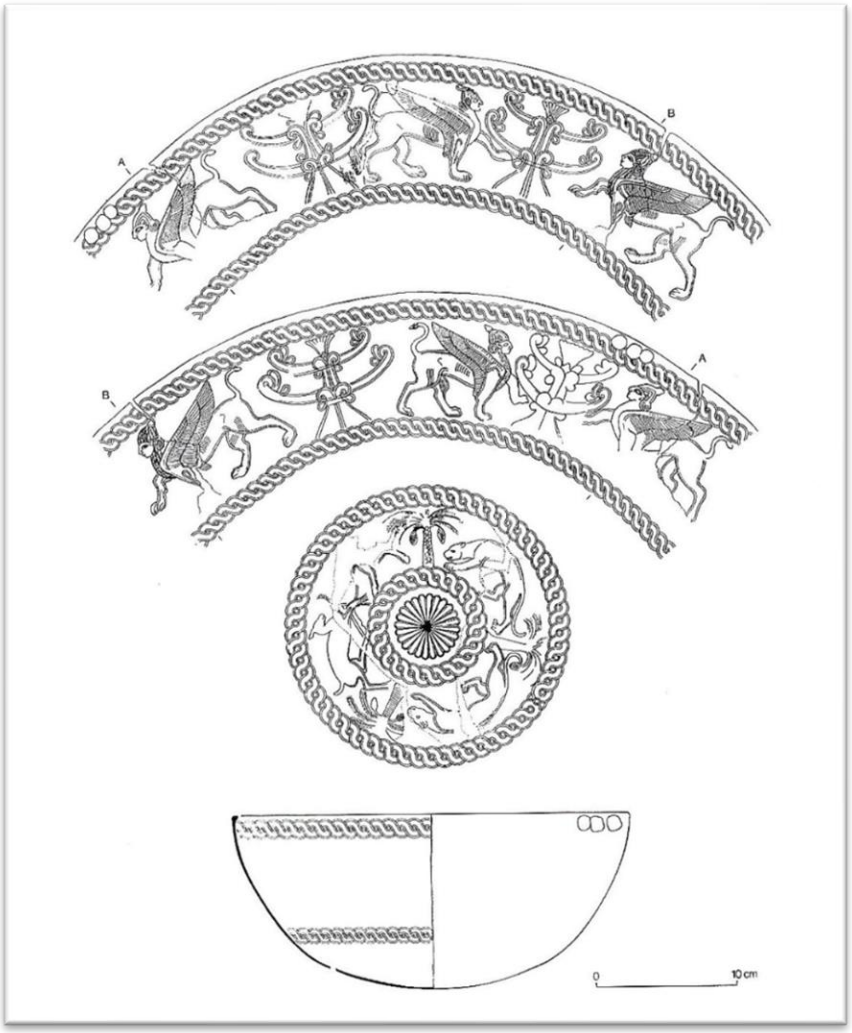


***Figure 3.19 Engraved Bronze Bowl from Touma Cemetery, T.55,28. From Popham 2004, Fig. 2.7.***

[314] Popham 2004, 17, Figs. 2.7, 2.8.

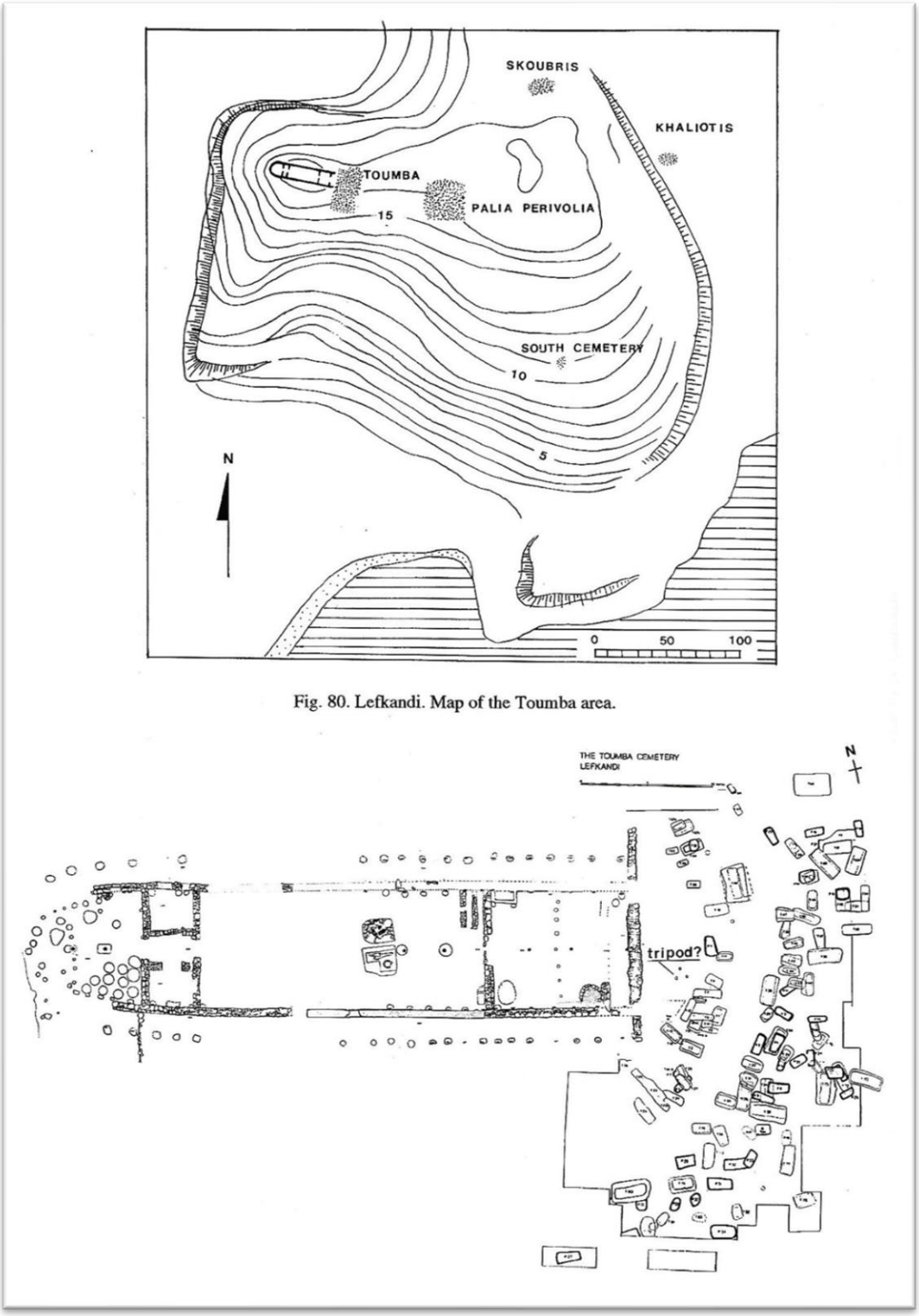


Fig. 80. Lefkandi. Map of the Toumba area.

***Figure 3.20 Map of Lefkandi and Plan of Heroon and Toumba cemetery, note shaft graves in middle of Heroon. From Mazarakis Ainian 1997, Figs. 80, 81.***

Near Eastern imports have also been found at Knossos and Kommos in Crete in 10th century contexts. At Knossos, Cypriot bronze tripod stands were found in mid-10th century mortuary contexts as was a bronze bowl from Teke Tomb J, inscribed with Phoenician writing.[315] Burial finds of gold jewellery of Phoenician design and a Sardinian askos (juglet), plausibly a Phoenician import, from Teke Tomb 2 suggest Phoenician trade along the north coast of Crete.[316] Contemporaneous with these burial finds at Knossos, are finds of Phoenician transport amphorae and Phoenician pottery at Kommos on the south coast.[317]

It is very interesting that almost all of the imported material found in mainland Greece and in Crete are from mortuary contexts, and that all of the goods, with the exception of Phoenician vessels from the port area of Kommos, are finished pieces.[318] There is no evidence of trade in commodities with exception of the Protogeometric transport jars from Kommos.[319] This is in stark contrast to the Late Bronze Age trade in bulk raw materials as seen in the Uluburun shipwreck and the Archaic period trade in metal ores and marble yet to be discussed.

From the 9th and 8th centuries, Near Eastern imports increased throughout the Aegean.[320] As per the discussion above, the route to Al Mina was a key component in the expansion of contact and exchange. Boardman considered the Orientalizing of Greek material culture to have begun sporadically *c.* 900 but did not manifest itself fully in Greek iconography until the 8th century (see Figs 3.21, 3.22). He considered the trade route from Al Mina heading from east to west past Cyprus and Rhodes to have been central to this as, in his analysis of the material that has

[315] Kourou 2008, 365-6, Fig. 5.
[316] Vagnetti 1989, 355, 358-60, n2, the stratigraphy of this tomb is disturbed, date range is 850-680.
[317] Shaw and Shaw 2000, 216, 220-4, Plates 4.63, 4.64, material from temple phase A.
[318] Murray 2017, Table 2.5.
[319] Murray 2017, 103.
[320] Kourou 2008, 366.

been found, the craftspersonship and designs found in Orientalizing-ware were much more northern Syrian than Phoenician.[321] This is supported beyond iconographic styles by the pottery at Al Mina, where Syrian or Cypriot items made up the majority of non-Greek ceramics, not Phoenician.[322]

***Figure 3.21 Bronze Drum from Idean Cave, Crete, 'Assyrian Style' Late 8th c. From Heraklion Archaeological Museum.***

[321] Boardman 2006a, 516; 1990, 185.
[322] Boardman 2006a, 518; Treister 1995 on Syrian metal workers in Greek settlements.

***Figure 3.22 Pithoi with Griffins, from Afrati-Arkades, Crete, 7th c. From Heraklion Archaeological Museum.***

Murray's catalogue comprises four pages of Geometric period Near Eastern imports found in Mainland Greece and Crete compared to just one page for the Protogeometric (which are almost all from the Late-Protogeometric period).[323] The array of Geometric imports is much broader including a wide variety of pottery types, bronzes, seals and scarabs, as well as jewellery.[324]

### 3.3.9 Iron Age Trade Within the Aegean and North-South routes

Ceramics indicate that intra-Cycladic trade increased as the Geometric period progressed. Only Cycladic and Attic pottery has been found at Delos prior to *c.* 750. By *c.* 700 this had changed.[325] Significant volumes of pottery from Paros, Naxos, and Rhodes have been found on Delos as well as some finds from Euboea, Corinth,

[323] See Murray 2017, Table 2.6.
[324] Murray 2017, 125, Table 2.12.
[325] Coldstream 2003, 215.

Cyprus, and notably, some from Crete. 'Melian Ware' most commonly produced as a large krater/amphora, seems to have been first produced on Paros *c.* 680 and later Melos (see Fig. 3.23). Melian ware was widely exported, and examples have been found in Tocra in North Africa and on the Thracian coast opposite the Parian colony at Thasos, founded *c.* 680.[326] Parian 'Aa' pottery was found on Rhenia and Mykonos and was similar to pottery forms produced on Thera, Melos, and Naxos. Parian 'wheel group' pottery was exported to Andros, Delos, Siphnos, Thera, and Aegina.[327]

[326] Paspalas 2012, 81.
[327] See Sheedy 1985, 188-9; Papadoupoulos and Smithson 2002, 163-6, 175, 178-9 on intra-Cycladic pottery developments.

***Figure 3.23 Melian Ware, Burial Amphora from Paroikia, Paros Cemetery, 7th c.. From Paros Archaeological Museum, no. A2652.***

Early Iron Age ceramics from Crete were few and largely contained to Thera but with some finds on Melos, Andros, and Delos.[328] Excavations from two Late Geometric Theran cemeteries show that locally produced pottery utilized rather coarse volcanic local clay while fineware items were imported from Crete and Corinth.[329] While an argument based on negative evidence, the amount of

[328] Coldstream 2003, 288-9.
[329] Coldstream 2003, 216-7.

Geometric and Archaic Cretan ceramics found in the Cyclades is significantly less than those attributed to the Middle, and especially Late Minoan, periods.[330]

***Figure 3.24 Cycladic Pyxis and elongated amphorae, from Knossos-Fortessa cemetery and Teke tombs, Geometric period - 8th c.. From Heraklion Archaeological Museum.***

[330] Comparing the volume at Thera alone is overwhelming. Contrast Nikolakopoulou 2009, 35, 37 with Coldstream 2003, 288-9, the LBA material is significantly greater.

Cycladic pottery was found on Crete at Eleutherna, Knossos, Kommos, Azoria, and Olous (see Fig. 3.24).[331] Shapes included elongated amphorae, belly handled amphorae, cups, skyphoi, oenochoe, pyxis, and Syphnian cooking pots which, with their bright red fabric, are notable.[332] The clay of Siphnos seems to have been particularly suited for cook-ware.[333] At Itanos in east Crete, Cycladic imports from 6th century contexts were found at the settlement cemetery and the extra-urban sanctuary Vamies.[334] Common types found at Olous and Itanos are skyphoi and cups, some with painted dots for decoration on the shoulder, a design also seen at Despotiko near Paros and in Tocra (see Fig. 3.25).[335]

***Figure 3.25 Cup sherds from Despotiko with painted dot decoration, early Archaic period.***

[331] Erickson 2010, 231; Coldstream *et al.* 2001, 23, 87; Shaw and Shaw 2000, 219, 222-224, 228.
[332] Coldstream, Eiring, and Forster 2001, 87.
[333] Boileau and Whitley 2010, 238-42.
[334] Erickson 2010, 231.
[335] Erickson 2010, 231, 294, n126.

### 3.3.10 Summary of Trade Route Observations

The evidence cited above clearly suggests that trade routes in the Aegean underwent a significant change between the Bronze Age and the Iron Age.[336] The Early Bronze Age trade seems to have been focused on the flow of mineral raw materials moving from the north to Crete in the south. This exchange developed from a trading relationship in the Early Bronze Age to what was likely a permanent Minoan presence in the Cyclades in the Middle and Late Bronze Age. This was most apparent in the western Cycladic islands of Keos, Kythnos, Siphnos, Seriphos, and Melos; all islands that have mineral raw materials derived from their volcanic geomorphology which were not present in Crete.[337]

Iron Age data suggests a different pattern. Most noticeable are several east-west routes: In the central Aegean, from Al Mina in northern Syria through the northern Cyclades to Euboea and after 700 through the central Cyclades to Corinth and Athens. In the southern Aegean, from Cyprus and southern Syria to Crete; passing Kommos on the south coast and Knossos along the north coast. These routes perhaps went on into the western Mediterranean.

In addition to markers of a change in trade routes, the quantity of finds changed. Minoan exports and imports during the Bronze Age are voluminous in comparison to the paucity of imports and near absence of Cretan finds outside of Crete attributable to the Iron Age.

Some of the ramifications of social contact and cultural exchange have been suggested above. These opportunities for exchange are a potential by-product of modifications to trade routes. A fuller discussion of this is better conducted after

[336] Demand 2011, 220, 223-9 suggested dramatic change in trade routes occurred across a broader Mediterranean context after the LBA. One example cited was people from Cyprus arguably taking over trade routes of Ugarit after its destruction.
[337] Mountjoy 2008, 467.

an examination of the Iron Age sites when the evidence of technology transfer can be appreciated and considered in parallel with the discussion on changes in trade routes.

# 4 Cycladic Site Analysis

## 4.1 General Introduction to Cyclades

The Cycladic island group consists of 32 islands (plus numerous islets and rocks) with an average size of 85 km² per island (see Fig. 4.1). As mentioned in Chapter 1, the islands were not a political affiliation but rather linked solely by geography. The group extends southeast from the tip of the Attic Peninsula. The nearest island to Attica is Keos, 12 km from Lavrion and the farthest island from the mainland is Thera, 180 km.[338] Geologically, the islands are volcanic, comprising the tops of mountains that rise above sea level.[339] Most of the islands are formed around a central peak such as Paros, Siphnos, and Seriphos or are bisected by a long central ridge such as Keos, Amorgos, Andros, and Tenos. Seismic activity is common. Sea levels have generally risen about two meters since antiquity, separating islands such as Paros and Antiparos that were once connected, perhaps as recently as the Archaic period.[340]

Artemidoros, quoted by Strabo (10.5.3), listed fifteen Cycladic Islands while Strabo had twelve and Pliny (*NH* 4.12.65-7) fourteen. The term Cyclades derived from the word κύκλος, "a ring or circle around" and referred to those islands that circled around Delos, making the definition geographic. Yet the southern islands Amorgos (80 km) and Sikinos (68 km) are closer to Delos than is Keos (82 km). To the east, Ikaria (64 km) would seem to qualify if geographic proximity to Delos was the criterion. This suggests something else was involved. Thucydides (3.104) recounted that from ancient times there was a great assemblage of the Ionians and the neighbouring islanders at Delos for the celebration of a festival in honour

[338] Dawson 2014, Table 6.4 lists 28 islands. This examination covers 32 islands in the central Aegean plus Crete.
[339] Sheedy 2006a, 16.
[340] Kourayos, Sutton, and Daifa 2018, 115; Dawson 2014, 27-32, Figs 2.2a-c with diachronic maps of sea levels, Fig. 2.4.

of Apollo. The southern islands were considered Doric rather than Ionian, best demonstrated through the Archaic scripts (see Figs 2.1, 2.2).[341]

The traveller Pseudo-Skylax defined the Cyclades as we do today but divided them into two groups: "those islands off of Lacedaemon (Melos, Kimolos, Oliaros (Antiparos), Sikinos, Thera, Anaphe, and Astypalia) and those off of Attica (Keos, Helene (Makronisos), Kythnos, Seriphos, Paros, Naxos, Delos, Rhenia, Syros, Mykonos, Tenos, and Andros).[342] The Greek National Statistical Service lists 44 islands in the nomos of the Cyclades. In 1940, 35 of the islands were inhabited, reduced to 26 by 1991.[343] The pull of economic opportunity in Athens has resulted in the depopulation of much of rural Greece.

The Cyclades are in the centre of the Aegean Sea. East – West transit between mainland Greece and eastern areas such as Anatolia and the Levant necessitated passing through the island group. Similarly, North – South movement would likely pass through the Cyclades. The islands are not on the fringe of maritime communication routes, but rather are at the very centre of trans-Aegean movement and exchange.[344]

[341] Craik 1980, 4-5.
[342] Sheedy 2006a, 13, 15, n87.
[343] Sheedy 2006a, 17.
[344] Constantakopoulou 2018, ix.

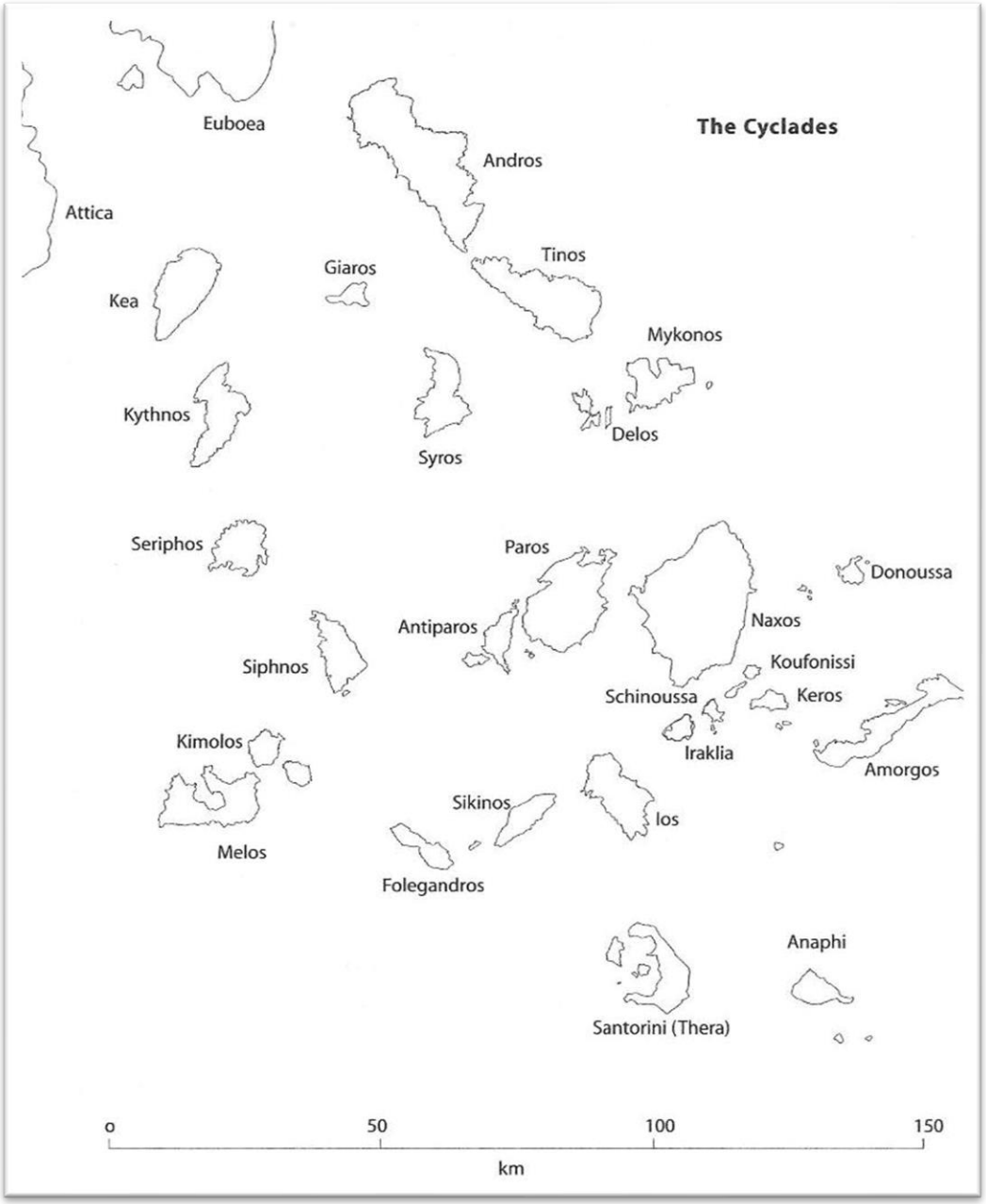


***Figure 4.1 Map of Cyclades. From Brodie, et al. 2008, preface.***

While the islands appear close to one another on a map, connectivity between islands is a function of maritime technology and seasonal weather patterns.[345] An Early Bronze Age paddle-driven longboat as depicted on the Syros 'frying pans' (see Fig. 3.7) would take approximately a week or so to transit the Cyclades going with the wind in benign conditions, while a Late Bronze Age sail-powered craft could make the same transit in a day or two.[346] Weather conditions are not a constant. An island group such as the western Cyclades that are easily within communication during settled weather periods can become isolated in the high-wind conditions during the height of the summer and especially so in the depth of winter, *i.e.* both connected by networks and isolated in turn.[347]

Ongoing excavations on Naxos at the island-like headland of Stelida to the southwest of Chora are uncovering Mesolithic occupation levels much earlier than any prior evidence would indicate for Cycladic occupation (see Fig. 4.58).[348] Prior to these discoveries, the earliest human habitation evidence was found on Kythnos at Maroulas dated to Late Mesolithic 8th millennium where human burials, a house floor, and some circular structures have been found.[349] Habitation evidence found on the larger islands dates to 5th millennium when seventeen of the islands were first inhabited, about 60% of the archipelago. Habitation spread to other islands over the next two millennia with most islands inhabited by the 3rd millennium.[350] Compared to other Mediterranean island groups, this is late, especially considering the proximity to the mainland.[351] Perhaps the relative lack

[345] Constantakopoulou 2007, 1-10.
[346] Broodbank 2000, 105, 341-9.
[347] Dawson 2014, 36-8; Cunliffe 2008, 51, Fig. 2.12; Cherry 1990.
[348] Sfyroera 2018, 328.
[349] Dawson 2014, 174, Table 6.2.
[350] Dawson 2014, 164-6, Fig. 6.19.
[351] See Dawson 2014 on other island habitation: Cyprus 11,000-9,000 BC pg. 140, Crete 130,000 BP pg. 136, Corfu 7,000 BC pg. 126, Brač 7,000 BC pg. 121, Corsica 9,000 BC pg. 87. Crete is the outlier with evidence for significantly earlier habitation, see Strasser *et al.* 2010.

of rainfall on these islands made agriculture difficult and consequently the islands were unattractive for settlement (see Fig. 4.2). Marangou in her excavations of Early Cycladic Markiani on Amorgos, commented that in order to survive in the small infertile Cyclades one needed to exploit every possible parcel of soil , the goal of an islander was to have a small house set in a field that extended as far as one could see.[352] Many of the islands have exploitable mineral resources. Speculatively, the development of metallurgy with the consequent demand for raw materials and settlement of the Cyclades may be linked events.[353]

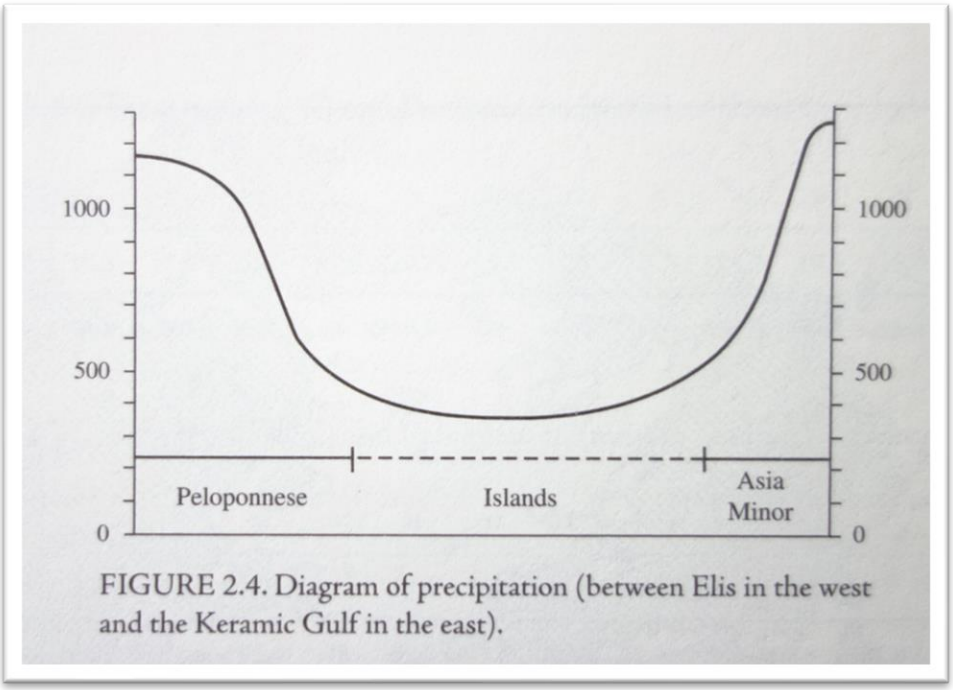


FIGURE 2.4. Diagram of precipitation (between Elis in the west and the Keramic Gulf in the east).

***Figure 4.2 Rainfall. From Bresson 2016, Fig. 2.4.***

[352] Marangou *et al.* 2006, 256-7.
[353] Renfrew 2011, 34, 455 remarked that metal and metal bearing ores were the first items worth trading.

Connectivity amongst islands has become a popular area of scholastic inquiry, often in association with network theory.[354] The islands are close enough to one another that navigation by sight is possible. Broodbank proposed a network of connectivity in the Cyclades structured around the length of a day's voyage utilizing Early Bronze Age technology of paddled transport prior to the development of sail (see Fig. 4.3). This brought most every island in contact with one another with just a few days paddling. This understanding was used to develop the thought that the Cycladic islands may have been more connected to one another than being separated by water might suggest.[355]

[354] See Manning 2018, 234-5, 252-5; Knappett 2011; Malkin 2011; Broodbank 2008, 63-7, Fig. 3.4; 2000.
[355] Dawson 2014, 128-31, Table 5.4; Broodbank 2013, Figs 7.31, 9.1; 2000; Malkin 2011; Constantakopoulou 2007; Horden and Purcell 2000, 123-171. See also Sheedy 2006a, 15-16.

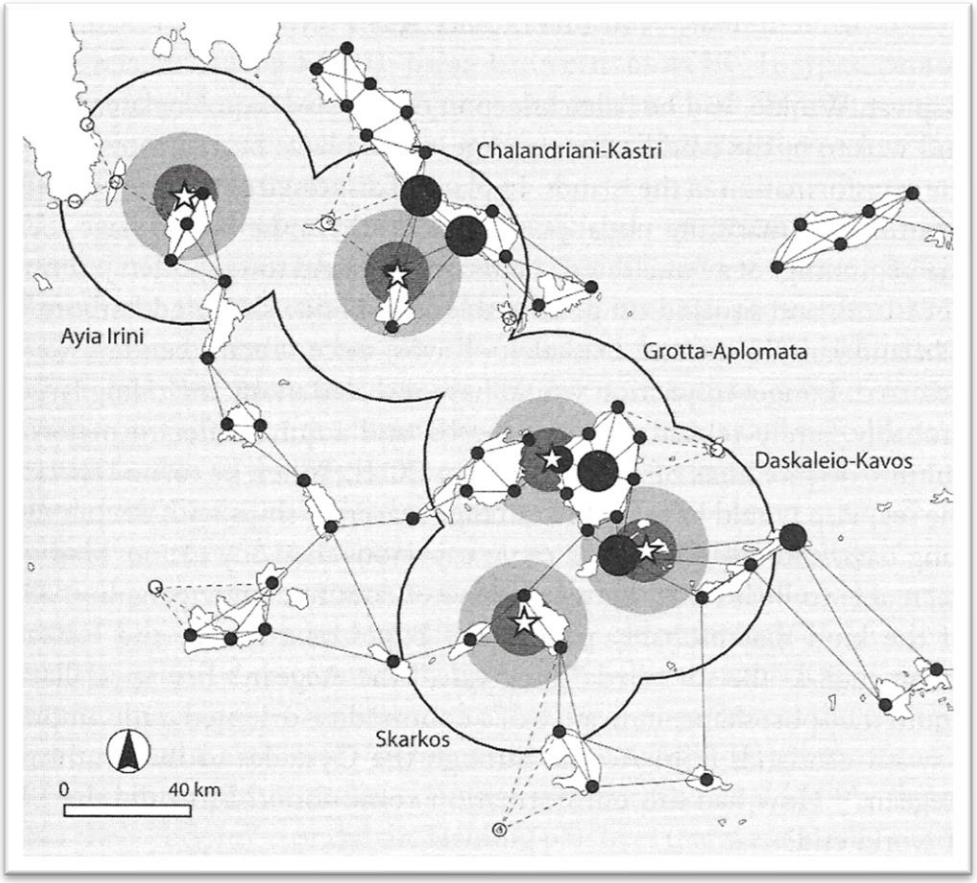


***Figure 4.3 Map of Early Cycladic paddling distances.. From Broodbank 2008, Fig. 3.4.***

Dark shaded area is one day out and back voyage, light shaded area is one day's one-way voyage, larger circle is one day's travel by long boat

Generally missing from this analysis though is the impact of weather.[356] Wind roses are diagrams developed to give a pictorial representation of wind direction over time (see Fig. 4.4, 4.5). The longer the line radiating from the centre, the more days (of the period under analysis) the wind blew from that direction (number in centre represents days of calm during the period). Consider Fig 4.4, an island to the north or to the northwest in the month of July would be near impossible to

[356] Broodbank 2000, 92-6 discussed the impacts of wind and current on travel noting correctly that even in the summer season high winds can block voyages for extended periods.

reach against the dominant winds. In October (Fig. 4.5), when the prevailing wind direction shifted, the islands to the north would become accessible again. Considering this real-life parameter, the connectivity between islands is seasonally dependent, i.e. not a constant.[357]

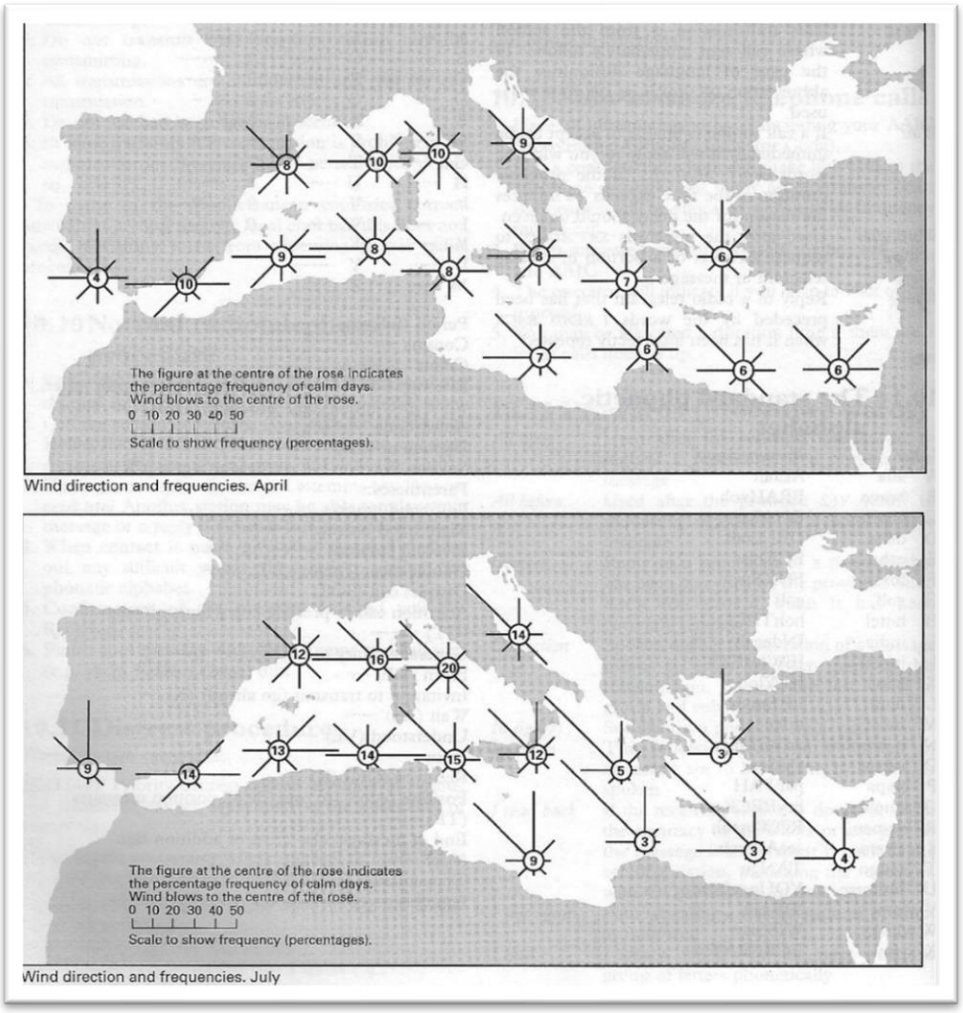


***Figure 4.4 Wind Direction, April top, July bottom. From Heikell 1998, 110.***

[357] Murray 1987 discussed whether modern winds equate with ancient winds. Based on a comparison of modern data with records compiled by Aristotle and Theophrastus, Murray concluded the modern and ancient wind data had strong correlation, especially for the Eastern Mediterranean.

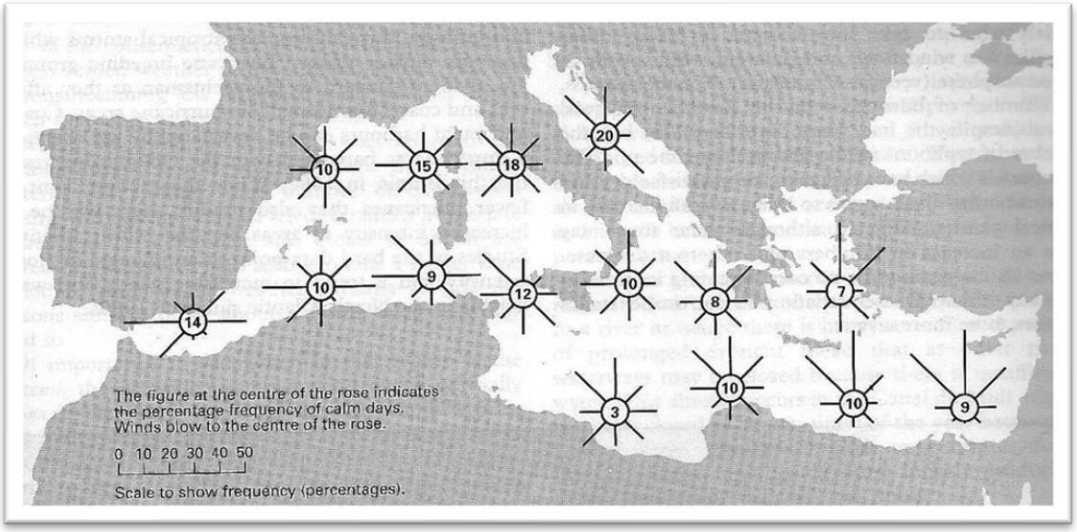


***Figure 4.5 October Wind Direction. Data from 1960-1980. From Heikell 1998, 111.***

Desborough in the 1960s proposed that following the destruction of mainland Greek Mycenaean palaces in Late Helladic III C Early, some groups migrated to the Cycladic islands to escape the upheaval, and that a Cycladic-wide post-palatial *koine* developed.[358] Subsequent archaeological investigation of Late Bronze Age Cycladic sites have not found evidence supporting a common identity. Pottery styles in the Late Bronze Age Cycladic centres of Ayia Irini (Keos), Koukounaries (Paros), Aghios Andreas (Siphnos), Phylakopi (Melos), and Grotta (Naxos) never developed a common theme but remained idiosyncratic.[359] The 'Close Style' of Late Helladic III C mainland pottery was not found in the islands. Walled enclosures at the above-mentioned sites plus at Xobourgo (Tenos), were all built with different designs, with different construction methods, and at different times. This suggests that they were not developed as a common response to a common

[358] Desborough 1993; 1964, 227-8; Mac Sweeney 2008, proposed a Mycenaean *koine*, especially among elites, had developed in the Late Bronze Age.
[359] Vlachopoulos and Mercourios 2015, 348.

threat, but rather as a series of unique responses to unique conditions.[360] Subsequent Geometric Period pottery suggest a varied array of mainland Greek connections. Euboean pottery is found at Zagora (Andros) and on Naxos, Attic at Keos and Koukounaries, and Laconian at Melos and Thera.[361] The physical evidence suggests that no overall Cycladic *koine* existed in the Early Iron Age, rather it indicates the individuality of each island. This observation suggests that each island must be investigated on its own. Some collective observations are possible, but as will be shown, the uniqueness of each island within the group is what comes through.

Notwithstanding the above, within the Cyclades are several sub-groups created by proximity or shared geological attributes. Considering the evidence by sub-group aids in understanding what the shared commonalities are, consequently, this presentation will be organized accordingly with additional introductory comments relative to each grouping.

[360] Vlachopoulos and Mercourios 2015, 348; Vlachopoulos 2008b, 491.
[361] Cambitogoulou 1981, 35-7, 48-64; Schilardi 2016, 175; Barber 2005, 2-6; Cherry and Sparkes 1982, 53-7.

## 4.2 Western String: Keos, Kythnos, Seriphos, Siphnos, Melos

### 4.2.1 Introduction

The five major islands that comprise the western line of the Cyclades consist (from north to south) of Keos, Kythnos, Seriphos, Siphnos, Melos, and Kimolos (see Fig. 4.1). Several factors combine to make this group of islands a sub-set within the larger Cycladic archipelago. First is the geology of the islands; all are predominantly micaceous schists and blue or grey limestone. In this group, mineral resources of iron ores, lead with silver content, and some copper ores occur in economically exploitable concentrations.[362] Melos is unique for other items such as obsidian and useful abrasives, and Seriphos had some hard-rock gold deposits (see Fig. 3.5). Second is the geographical arrangement of the islands. The islands lie in a north to south arrangement with only short distances between them. Each island has several good harbours, consequently, from a maritime network perspective, the western string is a series of easy steppingstones between Attica and Crete. Third, in what is arguably a reflection of the mineral resources and the proximate geography, in the Bronze Age each of the islands seems to have had a considerable Minoan connection, especially at Ayia Irini on Keos, Phylakopi on Melos, and Aghios Andreas on Siphnos. Despite these broad commonalities, each island had a unique history.[363]

### 4.2.2 Keos

#### 4.2.2.1 Introduction

Keos is 131 km² in area, and 561 m high (see Figs 4.3, 4.6). The terrain is very rugged with numerous deep ravines. The only flat agricultural land occurs in the northern part of the island and in the river valley near Poieessa. Extensive

[362] Cherry, Davis, and Mantzourani 1991c, 57.
[363] Gounaris 2005, 13-15, 20-4; Mountjoy 2008, 467.

terracing was required to create suitable soil conditions for agriculture.[364] Virgil remarked on the island's thick foliage fed presumably by springs.[365] Today, the island's coast is quite barren but the upland centre of the island south from Ioulis is covered with dense oak forests. These forests cover the highest point of the island which is unique in the Cyclades as on most other islands the mountain tops are bare rock.[366] Keos averages about 500 mm of annual rainfall compared to the Cycladic average of 400 mm, twenty-five percent greater.[367] The Bay of Aghios Nikolaos in the north of the island, is an excellent all-weather anchorage. It is not surprising that the Bronze Age settlement of Ayia Irini on the north side of the bay, and the Archaic settlement of Koressos on the western side, developed where they did (see Figs 4.6, 4.9).[368] In settled weather the northern bay of Otzias, the bay fronting Karthaia on the southeast corner and the anchorage at Poieessa are tenable.

Separated from Lavrion by twelve km, evidence of Attic connections is a notable feature of Kean prehistory and early history. Two examples of the close affiliation are material evidence of Bronze Age processing on Keos of lead ores sourced from Lavrion, and Hellenistic period epigraphic documentation of exclusive supply contracts with Athens of *miltos,* (red ochre).[369]

The site of Ayia Irini was extensively excavated by Caskey and others and published in multiple volumes.[370] Survey work on the northern portion of the island was done in early 1990s by Cherry, Davis, and Mantzourani (1991a) and Whitelaw

[364] Cherry, Davis, and Mantzourani 1991c, 57-9; see Temin 2013, 202-5 on increasing farmland as an increase in capital.
[365] Virgil *Georgies,* Book 1, 14-15, …cui pinguia Ceae ter centum nivei tondent dumeta invenci. (Neptune) for whom 300 oxen browse on Keos' rich thickets.
[366] Author's observation.
[367] Dawson 2014, Table 8.1.
[368] Cherry, Davis, and Mantzourani 1991c, 57.
[369] Mountjoy 2008; Gale 1998.
[370] Cummer and Schofield 1984 on Temple A.

(1998). Mendoni (1994) has done light survey work in the south and has been involved in almost all archaeology done on Keos over the past three decades. The sites of Koressos, Ioulis and Poieessa are largely unexcavated. Extensive reconstruction work has been done at Karthaia.[371]

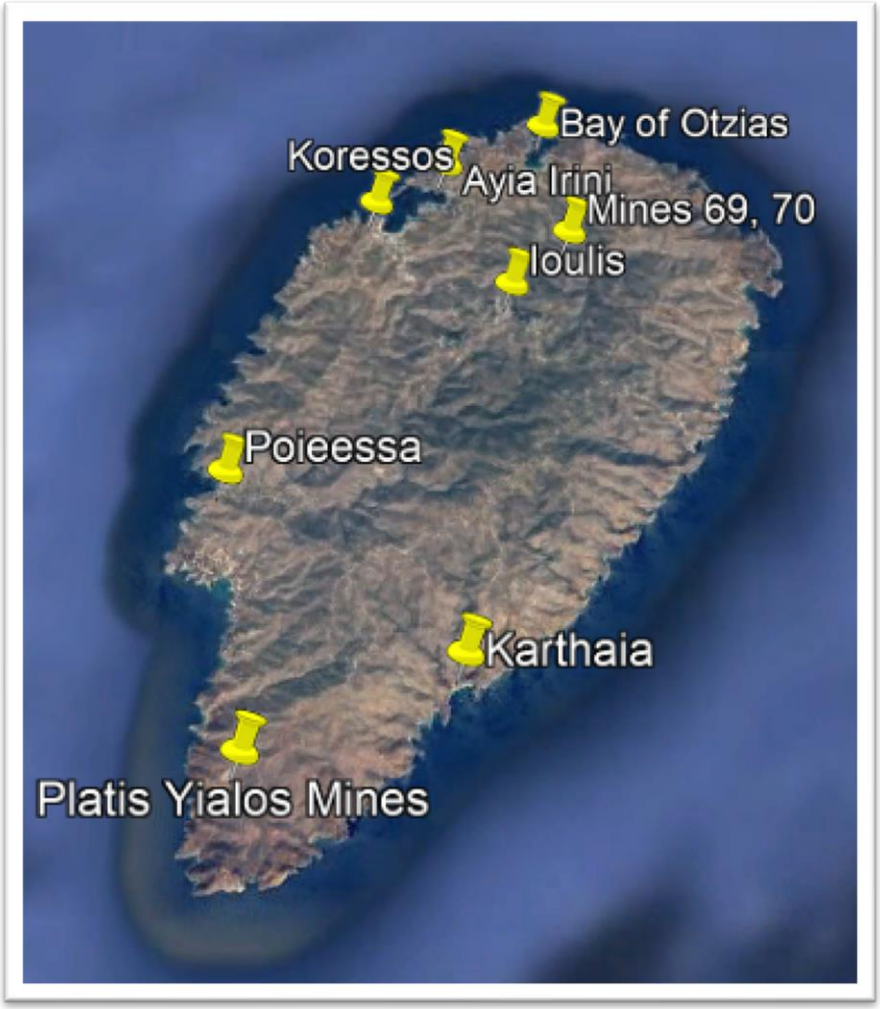


***Figure 4.6 Map of Keos. From Google Earth.***

[371] Simantoni-Bournia, Mendoni, and Panagou 2009.

#### 4.2.2.2 History

### *Ayia Irini*

The Bronze Age history of Keos is centred on Ayia Irini. Ayia Irini is sited on a small peninsula jutting into the Bay of Aghios Nikolaos. There appears to have been significant centralization at this one site even prior to evidence of Minoan interaction.[372] In the course of its history, Ayia Irini suffered several significant destructions.[373] The first at the end period IV (MM II and early MMIII pottery phases); second, end of period VI (LMIB/LH II); third, end of period VII (LHIIIA); and finally, the Late Helladic IIIC phase after which the settlement was not rebuilt and largely abandoned.[374] In the structure known as Temple A, deposits of LHIIIC pottery were one meter deep in places.

Within Temple A, ritual activities appear to have continued in subsequent centuries (see Fig. 4.7).[375] Shrine BB was built in Room Six with benches along the long wall and an entrance at the southeast corner. Some Protogeometric and Geometric period pottery sherds were found on the floor of this level (see Fig. 4.18 items 29, 30).[376] A shrine in Room One, noted for a stone head found in a ring stand, was dated to the Geometric period. This shrine continued in use to *c.* 500.[377] Anthippos of Ioulis left a cup dedicated to Dionysius (see Fig. 4.18, item 24).[378] Most of the imported pottery is Athenian (see Fig. 4.8) but there are exceptions: A Naxian pot from second half of 8th century, and a deposit of miniature Corinthian

[372] Cherry, Davis, and Mantzourani 1991b, 5.
[373] Caskey 1998, 124-7; Caskey 1972, 393-400. Phase numerology from Caskey 1972.
[374] Dawson 2014, 221 discussed the thesis that Ay. Irini was abandoned between Periods III and IV and that this abandonment phase is the best evidence for a wider pan-Cycladic abandonment early 2nd millennium BC. Dawson's position is not universally supported. See Broodbank 2000, 320; Rutter 1984 for argument against.
[375] Gounaris 2005, 21-2, 29-30.
[376] Caskey 1998, 127, Figs 11, 23, n16; Gounaris 2005, Fig. 4.
[377] Caskey 1998, 127.
[378] Caskey 1998, 127, 128, n2 argued that these shrines were all dedicated to Dionysius.

skyphoi found above shrine BB (see Fig. 4.18, items 25, 26). Shrine AA, occupied the northwest half of Room Three, dated to the 4th century, and over the southeast part of Room One, was a shrine of Late Hellenistic times.

## *Four Poleis*

The Iron Age ritual activities at Ayia Irini suggest some continuity of use after the Bronze Age. This, however, runs in contradiction to the evidence from field surveys. Field surveys from northern and southern Keos found almost no signs of habitation in the Protogeometric and Geometric periods.[379] The Northern Keos survey found broad distribution of pottery dated 700-200 but almost no material dated 1000-700.[380] Only one sherd was positively identified as Protogeometric or Geometric (cup base with pink fabric (perhaps Attic), thin black gloss).[381] Other items possibly from this period were a banded-handle Corinthian cup, rim and spout of a basin, and coarseware finds consisting of a pithos rim and a Corinthian pithos handle (see Appendix B2).[382] These are the only finds possibly attributable to the Early Iron Age that were collected from 24 km². Moreover, the survey area included all environs around the Bay of Aghios Nikolaos including Ayia Irini, the Archaic *polis* territory of Koressos and part of the territory of Ioulis, all attractive areas for habitation.[383] Survey work in southern Keos similarly found little evidence dated to Protogeometric or Geometric period.[384] Near Poieessa, the only Protogeometric sherds were found near Tourkos, and at Karthaia only within a 1.5

[379] Mendoni 1994; Cherry, Davis, and Mantzourani 1991a (northern Keos); see Cherry and Davis 1998, n5 other surveys on Keos; *AR ID 2012,* 3258 reported current survey work on Keos not yet published; Dawson 2014, 222 argued that Keos and Melos were both abandoned between *c.* 1100-700 with only Grotta on Naxos having evidence of occupation during this period; Reger 1997, 462, n71 gives summary of survey finds.
[380] Sutton 1991, 245.
[381] Sutton 1991, 95, Fig. 5 item 29.6.
[382] Sutton 1991, gazetteer items 7.6, 59.8, 20.2, 26.14 respectively.
[383] Cherry, Davis, and Mantzourani 1991a, xv.
[384] Mendoni 1994, 147-61; Cherry and Davis 1998, 218.

km radius of the eventual *asty.*[385] The *chora* of Karthaia appears to have been virtually uninhabited at the beginning of the 6th century.[386] Surveys of southern Attica and southern Euboea (with the exception of the settlement at Rigia) also lack evidence of habitation between 1100 to 700.[387] The disparate evidence between 1000-700 from the continuing usage of shrines within Temple A at Ayia Irini and the lack of habitation evidence from surveys, raises the question of just who was tending the shrines. Logic dictates three possibilities; one, the island was so lightly settled that only scant traces of occupation have survived; two, records of occupation were obliterated by later occupants, or three, the shrines were tended by visitors from off-island.

***Figure 4.7 Deep Bowls from Room XI of Temple A at Ayia Irini dated c. 1000. From Kea Archaeological Museum, items 115-116.***

[385] Mendoni 1994, 150, 152.
[386] Mendoni 1994, 152.
[387] Cherry and Davis 1998, 219-20.

***Figure 4.8 Attic Kantharos, late 6th c. from Classical shrine built in Temple A at Ayia Irini. From Kea Archaeological Museum.***

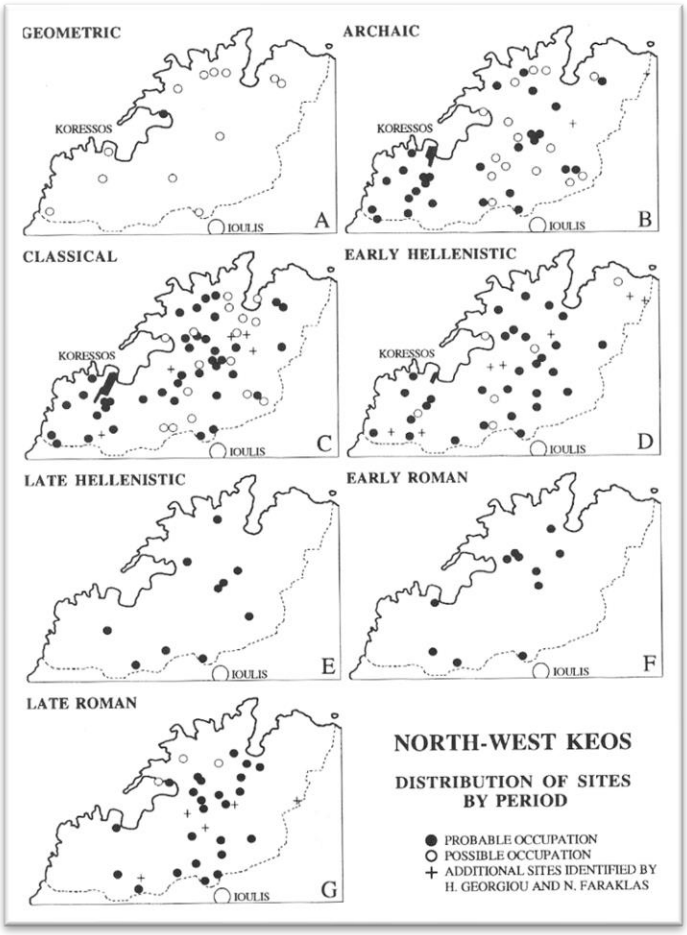


***Figure 4.9 Site Density by Period. From Whitelaw 1998, Fig. 1.***

In the 7th century, the evidence of settlement on Keos developed in a manner unlike that on other Cycladic islands. In the Archaic period, four independent *poleis* were founded; Koressos on the ridge above the western shore of the Bay of Aghios Nikolaos, Ioulis in a commanding inland position looking down onto the bay of Aghios Nikolaos, Poieessa in the southwest, and Karthaia in the southeast (see Fig. 4.6).[388] All were founded in the late 7th to early 6th century.[389] Speculatively, Attic and Euboean ceramics suggests people from these areas had close relations with Keos and may have been involved with incoming groups in some manner.[390] The boundaries between Kean *poleis* are unknown.[391] Site observations suggest that Ioulis, Poieessa, and Karthaia were in distinctly different drainages. There is no apparent geomorphological boundary between Ioulis and Koressos.[392]

The earliest settlement at Karthaia was on the flat-topped Koulas hill dated to the very Late Geometric period (see Figs 4.12, 4.13). On a lower terrace, *c.* 530, a temple to Apollo Pythian was built and on an upper terrace, *c.* 500, a temple to Athena was constructed.[393] At Koressos, a fortification wall encompassed the lower acropolis (see Fig. 4.10).[394] The well-known kouros of Keos was found down the slope of the settlement in association with a later 6th century Corinthian hydria.[395] There are traces of an Archaic temple on the upper acropolis of Agia

[388] Whitelaw 1998, 229, n13; Cherry, Davis, and Mantzourani 1991b, 5; 1991d, 235.
[389] Mendoni 1994, 150.
[390] Simantoni-Bournia, Mendoni, and Panagou 2009, 55; Reger 1997, 466; Cherry, Davis, and Mantzourani 1991b, 5; Jeffrey 1990 (1961), 297-8 suggested *IG* xii.5 649 could be interpreted as early Eritrean control of Keos; Strabo 10.1.10, suggests Euboean control but without any mention of when. Athenian relations are attested by material evidence of metal ores, pottery, and later epigraphy as discussed in the body of the text.
[391] Mendoni 1994, 148; Cherry, Davis, and Mantzourani 1991d, 235-6; Whitelaw 1998, 233. Boundaries in Fig 5.5 inset were developed by taking the midpoints between *poleis* factoring in walking distances in developing a Thiessen polygon.
[392] Reger 1997, 451.
[393] Simantoni-Bournia, Mendoni, and Panagou 2009, 72; Mendoni 1994, 153.
[394] Whitelaw and Davis 1991, 267 the wall was severely damaged by a bulldozer-cut modern road and is not datable.
[395] Whitelaw and Davis 1991, 267.

Trada. Numerous Corinthian pan and cover tiles in the vicinity suggest a late 6th century date.[396] Poieessa is on a ridge overlooking an attractive anchorage with reasonable shelter from north winds (see Fig. 4.11). The settlement is at the head of a well-watered, rich agricultural valley. Remains are scant with traces of worked stone and pottery. Ioulis has spolia of Archaic worked stone built into later structures. The four *poleis* remained independent until the Hellenistic period.[397]

***Figure 4.10 Ridge of Koressos, Attica in distance.***

[396] Whitelaw and Davis 1991, 268.

[397] Strabo X.5.6 Κέως δὲ τετράπολις μὲν ὑπῆρξε, λείπονται δὲ δύο, ἥ τε Ἰουλὶς και ἡ Καρθαία, εἰς ἃς συνεπολίσθησαν αἱ λοιπαί, ἡ μὲν Ποιήεσσα εἰς τὴν Καρθαίαν ἡ δὲ Κορησία εἰς τὴν Ἰουλίδα, Keos had four poleis that became two, Ioulis and Karthaia. Poieessa was absorbed into Karthaia and Koressos into Ioulis; Reger 1998, 637-9 suggested the mergers occurred under circumstances most likely related to Hellenistic Ptolemaic and Macedonian machinations; Mendoni 1994, 153-4.

***Figure 4.11 Polis of Poisseea on top of ridge above anchorage.***

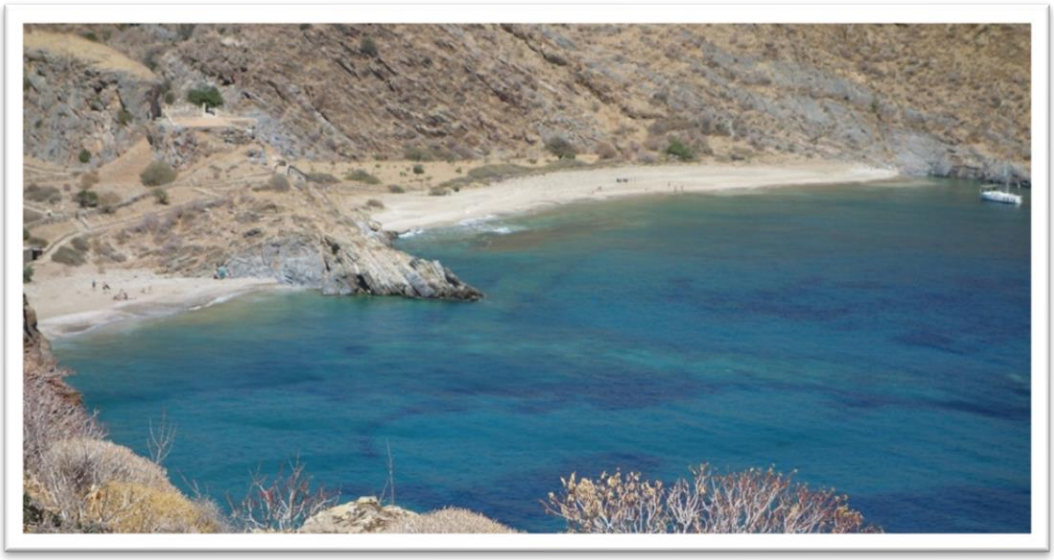

***Figure 4.12 Karthaia.***

Note underwater harbour mole and quay, temple to Apollo overlooking the bay.

***Figure 4.13 Karthaia.***

***Figure 4.14 Steep terraces at Ioulis.***

From inception, these communities seem to have been formed as *poleis*, which coupled with the lack of Protogeometric material, suggested to Cherry, Davis, and Mantzourani that Keos may have been settled by four different influxes of settlers, resulting in political distinctiveness and autonomy (see Fig. 4.15).[398] The earliest attestation of the independent status of each *polis* was the issuance of silver coinage in the 6th century from Karthaia, Koressos, and Ioulis (no examples of coins from Poieessa have been identified.)[399] At times however, the island communities were termed Κήιοι, rather than by the name of each *polis*. Herodotus (8.1, 46) recorded that the Κήιοι supplied two triremes and two penteconters to the Greek fleet at Artemisium and at Salamis. Bacchylides in the 5th century, wrote in an Olympic Ode to Lakhon that he brought honour to Keos, rather than to his *polis* (both Bacchylides and Lakhon were from Ioulis).[400] In contributions to the Delian league, the Keans first appear in 451/450 with Koressos recorded independently and the other three *poleis* assessed as a group. Subsequent records all refer to the Κήιοι.[401] The common assessment implies that there was some mechanism amongst the four *poleis* to determine individual shares.

[398] Cherry, Davis, and Mantzourani 1991b, 5; this lends support for Dawson's suggestion of abandonment *c.* 1100-700.
[399] Simantoni-Bournia, Mendoni, and Panagou 2009, 56, Figs 18, 19, 20, Ioulis's coin had a bunch of grapes, Koressia's a cuttlefish, and Karthaia's an amphora; see Sheedy 1998, 249, 252 on individual mints and lack of material attributable to Poieessa; Cherry, Davis, and Mantzourani 1991d, 238; Whitelaw and Davis 1991, 266.
[400] Bacchyl. *Ep.* 6.15-16: στάδιον κρατήσας Κέον εὐκλέιξας; Reger 1997, 474.
[401] Meiggs 1972, 119-24; Cherry, Davis, and Mantzourani 1991d, 239, n4; Reger 1997, 476.

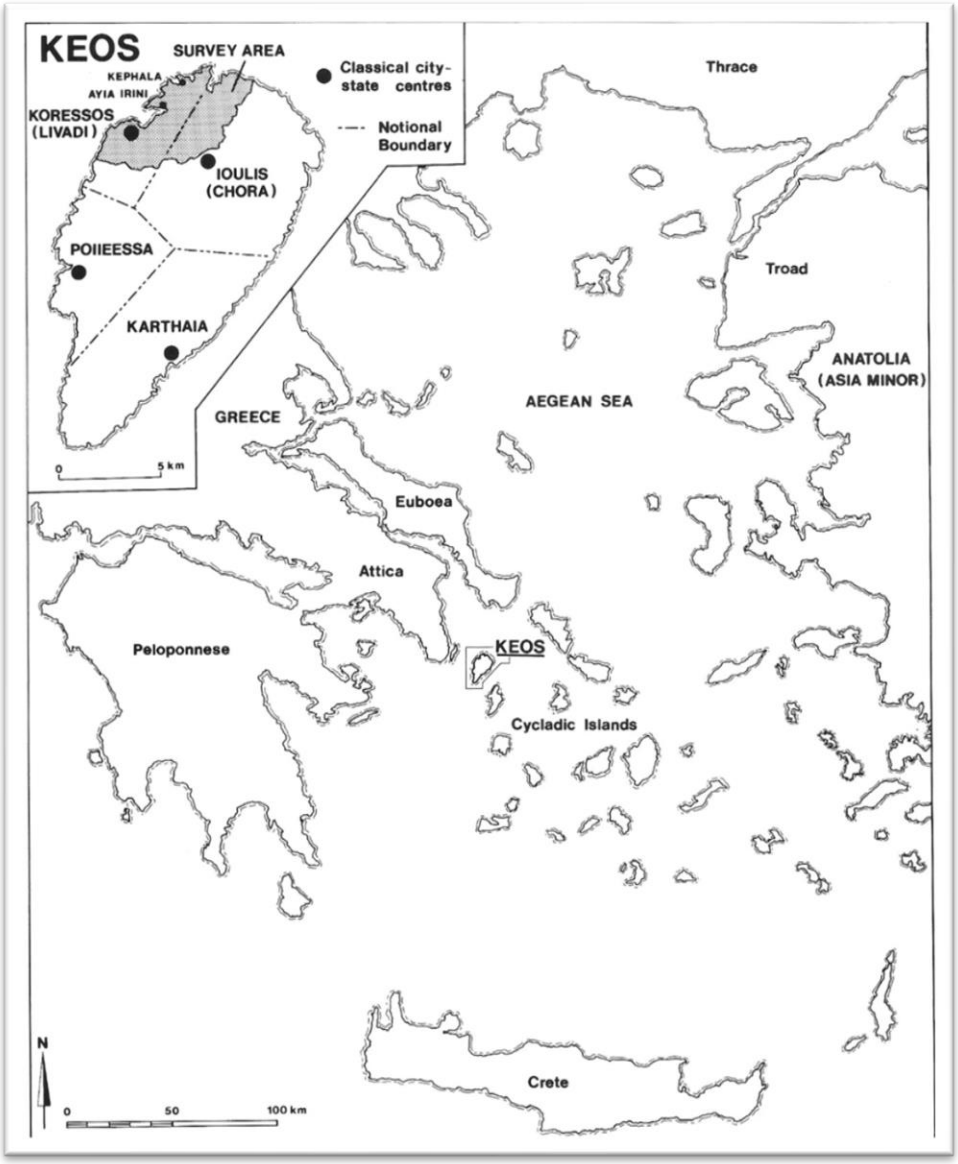


***Figure 4.15 Map of Keos with Thiessen polygon boundaries for each polis. From Cherry and Davis 1998, Fig. 1.***

### 4.2.2.3 Economy

Other than Ayia Irini and restoration works at Karthaia, the archaeological studies on Keos have largely been field surveys rather than excavations. One of the goals of both the northern and southern surveys, was to attempt to understand the use of the rural landscape in the form of residential farm steads, field processing facilities, and farm plots worked by people who lived in the *asty* of the various

*poleis*.[402] As mentioned above, the topography of much of Keos required extensive terracing to support soil adequate for agriculture (see Fig. 4.14).[403] Terrace construction and terrace maintenance is hard labour than must be performed continuously to preserve the terraces. This implies cooperation and proximity amongst farm populations. The sparse evidence of occupation from the Geometric period suggests that only the most fertile areas for agriculture would have been exploited leaving significant areas free for animal grazing and bee keeping (see Fig. 4.9).[404] Aelian (*De Natura Animalium* 16.32) preserved an excerpt from Aeschylides (3rd century) in which Aeschylides commented on Kean farming practices: "Fodder was used to feed sheep, from which milk, cheese, and young lambs were produced" and remarked on the thin soil of Keos.

The base agrarian and pastoral economy of Keos was supplemented with mining activities and metallurgy from the Bronze Age onwards. Crucibles and tuyeres, slag, copper ingot fragments, and litharge were found at Ayia Irini in stratified Late Minoan contexts. Room A had at least thirteen lumps of litharge in it.[405] Litharge (tetragonal lead monoxide) does not occur in nature but rather is a waste product from smelting and cupellating lead ore to separate silver from lead. Galena is a natural mineral form of lead sulphide and is the most likely lead ore to contain high silver content. Galena has been found at the southern tip of Keos at Nikoleri (Platis Yialos, see Fig. 4.6).[406] Tests (using instrumental neutron activation analysis) show galena from Keos had very low silver content, below that of what would

[402] Whitelaw 1998, 228, 230-2, n32; Mendoni 1994, 150, 155, n62 argued against suggestion of Georgious and Faraklas 1993 that there were some villages in northeast Keos, she concluded they were farm clusters based on finds.
[403] Mendoni 1994, 156-7, n85 on terracing generally; From personal observation, while all the Cycladic islands required extensive terracing to create agricultural land, the terracing required on Keos due to the steepness of the hills was the most extreme of all the islands observed.
[404] Sutton 1991, 260-3, Fig. 11.19 recorded many sherds of beehives; Reger and Risser 1991, 307 Hellenistic coins from Keos had a bee motif.
[405] Gale 1998, 740.
[406] Gale 1998, 743, n70.

normally be considered economical for processing.[407] Lead isotope testing of the lead objects and litharge found at Ayia Irini show that the lead ore of the majority of the items tested originated not in Keos, but in Lavrion.[408] Gale suggested that Late Bronze Age Ayia Irini was a metallurgy centre, where ores brought from Lavrion for eventual shipment to Crete were processed.[409] The oak forests seen today coupled with Virgil's statement, suggest that wood fuel for smelting may have been available on Keos.

Another example of processing imported raw materials, was finishing work done on Parian marble imports in the 6th century. Several houses on Keos, particularly at Karthaia, had waste piles of Parian marble chips.[410] The temple to Athena at Karthaia is the earliest example of a peripetal Doric temple in the Cyclades *c.* 500. Finds from the temple made of Parian marble include parts of the entablature, sculptural decorations, and roof tiles (see Figs 4.16, 4.17).[411]

[407] Gale 1998, 744-5.
[408] Gale 1998, 748, 751, Table 5.
[409] Gale 1998, 752.
[410] Kazamiakis 2010, 405-8; Simantoni-Bournia, Mendoni, and Panagou 2009, 123, Fig. 85.
[411] Kazamiakis 2010, 408.

***Figure 4.16 Roof tiles from Temple to Athena at Karthaia, made of Parian marble.***

***Figure 4.17 Parian marble from Kean workshop, early 5th c. From Kea Archaeological Museum, item 550.***

In the historical period, the production of *miltos* (μίλτος, also called ruddle) on Keos followed a similar model of custom processing for export. *Miltos* is red ochre, a mixture of red ferric oxide with clay, sand, and other impurities. Theophrastus (*De Lapidibus* 8.52) wrote towards the end of the 4th century "the most noble *miltos* came from Keos, plentiful (*miltos*) is produced there from mines but also from the iron mines which have *miltos* too."[412] This suggests that *miltos* was both a by-product of iron ore mining and a target product.[413] *Miltos's* primary value is its colour and that it is easily ground into a powder. When ground and suspended in water, *miltos* had a multitude of uses such as waterproofing (to a degree) ships, as a wash to lighten the colour of ceramic vessels, and as an additive to produce a good red glaze.[414] All of these applications were attractive to the Athenians. The acute Athenian interest in Kean *miltos* is preserved in a series of decrees that, while dated after the period under examination, are illuminative. Individual *poleis* granted to the Athenians a series of rights: 1. exclusive right of purchase for 100 per cent of the output (including future rights) of their *miltos*, 2. set the transport fee the Kean *miltos* producer would pay to the Athenian ship-owner for transport of the product to Athens, and 3. stipulated that the payment of the import duty in Athens would be the responsibility of the *miltos* producer. The decrees specified stiff penalties for enforcement.[415] Despite the seemingly harsh terms of this trade, that the Keans continued to produce *miltos* suggests that it was a profitable enterprise. Traces of *miltos* works are broadly distributed across the island.[416] Bent described the mines as deep holes chiselled in the side of a mountain with bright

[412] Urn:cts:greekLit:tlg0093.tlg004, *De Lapidibus* 8.52, βελτίστη δέ δοκεῖ μίλτος ἡ κεία εἶναι. Γίνονται γὰρ πλείους ἡ μεν οὖν ἐκ τῶν μετὰλλων, ἐπειδὴ καὶ τὰ σιδηρεῖα ἔχει μίλτον.
[413] Cherry, Davis, and Mantzourani with Rosoker and Dvorak 1991, 299-303.
[414] Cherry, Davis, and Mantzourani 1991a, 299.
[415] *Ibid.,* 299-300. The decrees of Koressos and Ioulis are well preserved, Karthaia extremely fragmentary, Poieessa is missing, *IG* ii² 1128 preserves three decrees. The decrees date before 350.
[416] *Ibid.,* 300-1.

red rock, visible marks left by ancient tools, and numerous lamps inside.[417] Mine works are difficult to date. Classical period pottery, which predates the epigraphy evidence by a century, was found in association with site 69, about 250 m northwest of a major mine at site 70, between Ioulis and the Bay of Otzias (see Fig. 4.6).[418]

These three examples, smelting Lavrion lead, shaping Parian marble, and iron and *miltos* production, demonstrate that the Keans incorporated additive economic practices across several periods. These also suggest that proximity to Attica was a significant factor in the island's development and served as both a supply source of raw materials and a market for value-added goods.

#### 4.2.2.4 Pottery

The interconnectedness with raw material sources and markets is reinforced by an examination of pottery. The paucity of Protogeometric and Geometric periods finds has been noted. From 700-200, imports from Attica, Corinth and other Cycladic islands were found widely distributed in the northern and southern surveys.[419] Almost all fineware was imported, dominated by Athenian-ware, with Corinthian second. Melian and Syphnian Archaic pieces were also found. Attic imports included black gloss closed vessel shapes, column krater, and black figure bird on a handle.[420] Attic red-figure was more common than black-figure.[421] Corinthian-ware consisted of skyphoi and three column-kraters.[422] Archaic Cycladic imports consisted of fragments of mugs with sharply offset rims mostly

[417] Bent 1885, 464.
[418] Cherry, Davis, and Mantzourani 1991a, 300-3.
[419] Sutton 1991, 245; Mendoni 1994, 150, 152, 154.
[420] Sutton 1991, Gazetteer Fig 5.2, item 17.3, 17.4, 11.1.
[421] Sutton 1991, Fig. 11.4 shows distribution.
[422] Sutton 1991, 252.

made from bright red Syphnian fabric, and a so-called Melian plate whose fabric suggests Parian origin.[423]

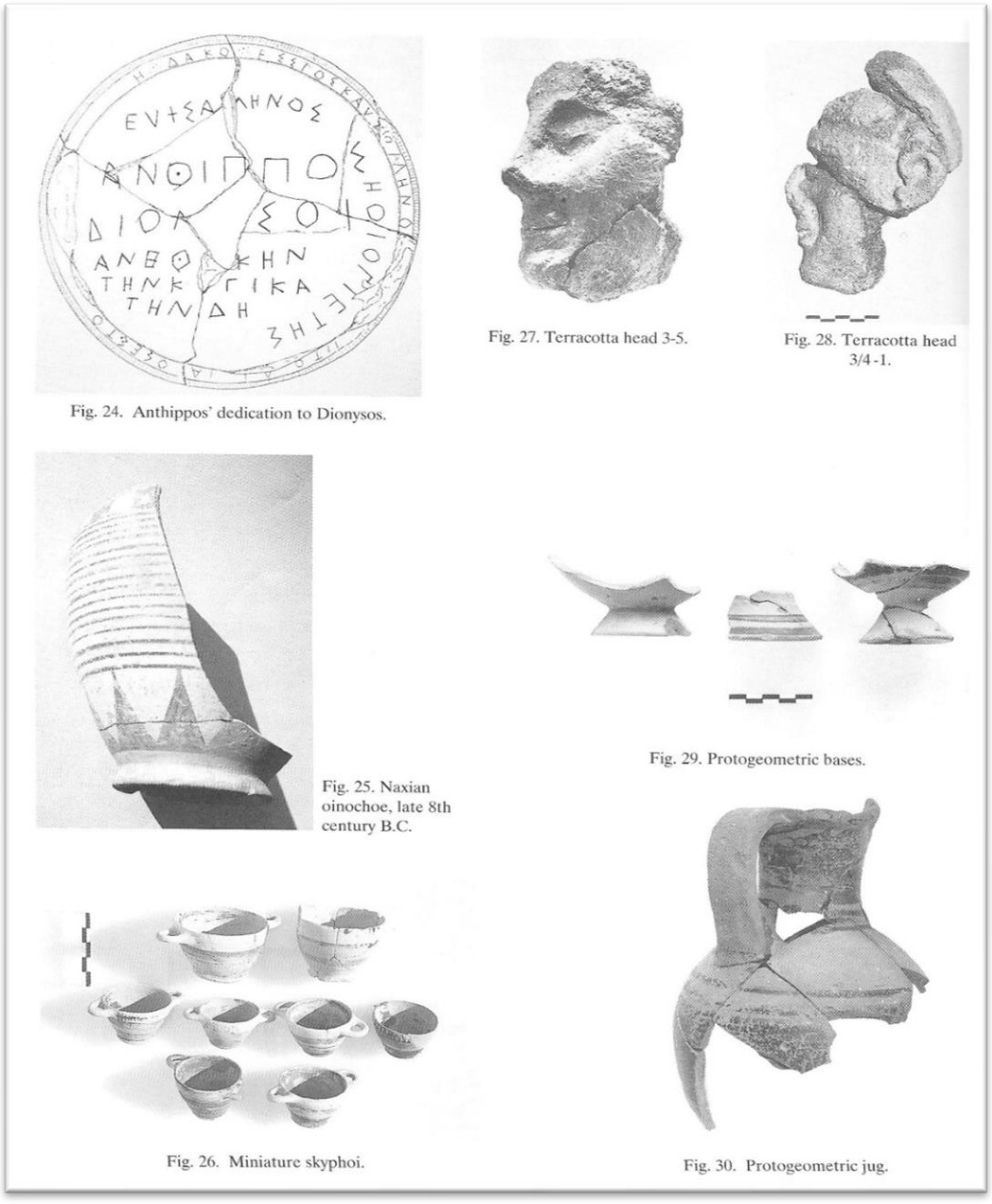


***Figure 4.18 Kean pottery. From Caskey 1998, 138.***

[423] Sutton 1991, Gazetteer Fig. 5.3, items 9.2, 26.7, 40.2, 40.3, 40.5.

#### 4.2.2.5 Summary

Ancient Keos had a singular history among the Cycladic islands. The Bronze Age occupation was concentrated at Ayia Irini.[424] Following the destruction of Ayia Irini, the island was nearly uninhabited until the 7th century. Four independent *poleis* were founded in the early Archaic period. These four *poleis* continued as independent entities until the late 200s.[425] At each phase, additive economic activities such as lead/silver ore processing, marble working, or iron ore mining were evident. Moreover, the harsh landscape for agricultural productivity requiring extensive terracing. The early evidence at the four Archaic *poleis* of non-agricultural economic activity suggests that arrivals to Keos came specifically for mineral exploitation. Proximity to the Greek mainland and a good harbour at Aghios Nikolaos which made Keos an attractive 'first stop' on a trans-Aegean voyage originating from the Saronic Gulf must have contributed to a close association between Keos and the mainland (see Fig. 4.1). This seems evident in the pottery of Athenian and Corinthian-ware and the later epigraphical evidence. Keos seems arguably the most mainland centric of the Cycladic islands.

### 4.2.3 Kythnos

#### 4.2.3.1 Introduction

Kythnos is 11 km southeast of Keos, 38 km from southern Attica. The island is 280 square km, with a height of 507 m (see Fig. 4.19). The terrain is not as steep as

[424] Cherry, Davis, and Mantzourani 1991b, 5 noted this centralization of Bronze Age material at Ayia Irini predated the demonstrable contact with Minoan Crete. The argument is based on lack of Bronze Age finds elsewhere on Keos.

[425] *Ibid.*, 5 commented that Keos did not consolidate into a single center (at Ioulis) until Late Antiquity and that this lack of consolidation was unique to the ancient Cyclades.

Keos, particularly in the northern part of the island. Kythnos has many excellent all-weather anchorages and port locations on both the east and west coasts.[426]

Iron Age settlement was concentrated at a single *polis,* modern Vrykastro on the west coast between the bays of Apokrousi to the north and Episkopi to the south, both excellent harbours.[427]

Vrykastro is currently being excavated under the direction of Mazarakis Ainian whose work is widely published.[428] Stos-Gale has investigated the mining activity on the island.

#### 4.2.3.2 History

As mentioned, evidence of early human habitation in the Cyclades has been found at Maroulas on the northern-eastern end of Kythnos (see Fig. 4.19). Burials in cist graves and housing structures have been dated to the Late Mesolithic period, *c.* 8200-7700.[429] The earliest proven industrial site for the processing of metal ores in the Cyclades is from Skouries on Kythnos.[430] These deposits date to Early Cycladic II period, *c*. 3000-2800, corroborated by C14 testing of charcoal found in the slag and pottery (see Figs 3.5, 4.20).[431] Bronze Age settlements were dispersed across the landscape and not concentrated into a single location as on Keos and

[426] Georgiou 1998, 212-13.
[427] Mazarakis Ainian 1998, 367, Figs 1-2, 1-4.
[428] Mazarakis Ainian 2017b.
[429] Dawson 2014, 128-9, Fig. 5.3, Table 5.4.
[430] Stos-Gale 1998, 719. Note 'σκουριά' means 'slag, cinder, rust' in modern Greek, and is a place-name commonly used for places with slag deposits. Recent excavations from Dhaskalio have found similar sophisticated metal processing facilities. The Dhaskalio structures also date to earliest Bronze Age strata. See www.cam.ac.uk/research/news/unusually-sophisticated-prehistoric-monuments-and-technology. Posted 18 Jan. 2018, accessed 18 July 2018. All ores would have been imported as Dhaskalio has no native metal resources.
[431] Stos-Gale 1998, Table 1.

Melos.[432] The island seems to have been nearly abandoned at the end of the Bronze Age.

Herodotus (8.46) mentioned in a list of island participants in the Battle of Salamis, that the Kythnians were descended from Dryopians. Stephanus of Byzantium dated the Dryopian arrival on Kythnos to the end of the Bronze Age, and that the island was named after the leader of the Dryopians.[433] Dio Chrysostom wrote that in the Early Iron Age, new settlers arrived on Kythnos, this time from Athens and pushed out the Dryopians, some of whom may have ended up in Cyprus.[434] Four Early Iron Age population centres are evident: Vrykastro, Kastro, Kastellas, and Ayia Ioannis (see Fig. 4.19).[435] Vrykastro (Ancient Kythnos) developed into the only *polis* on the island by the 8th century speculatively due to its natural advantages of an excellent harbour and closest point of contact to Attica.[436] Vrykastro was occupied continuously from 10th century BCE to CE 6th or 7th century.[437] Based on Geometric pottery, the settlement seems to have started first on the island of Vryokastraki just off-shore and later spread up the hill to an acropolis, 145 m elevation.[438] The settlement eventually covered an area of *c.* 265 ha within a double set of defensive walls first constructed in the Archaic period. The extant defensive system probably dates to Late Classical/Early Hellenistic.[439] Kythnos seems to have close ties with Athens as they took part in the Battle at Salamis and appear at least twice on the Tribute Lists contributing three talents in 449/448 and

[432] Xatzianastasiou 1998, 259-73.
[433] *Ἐθνικά, Κύθνος*.
[434] Dio Chrys. *Χαρίδημος,* 80.26.9; Eust., *Σχόλια είς Διονυσίου περίπλουν*, 525; Hdt 7. 90.
[435] Mazarakis Ainian 1998, 377.
[436] *Ibid*.; Gounaris 1998.
[437] Mazarakis Ainian 2005, 87; 1998, 372. A Protogeometric skyphos sherd was found on the Middle Terrace.
[438] Mazarakis Ainian 1998, 367, 374. The island may have been connected to the shore in antiquity by an isthmus.
[439] Mazarakis Ainian 1998, 369.

six talents in 425/424.[440] The island was prominent enough in the Classical period for Aristotle to write *Κυθνίων Πολιτεία*, a work that does not survive. Kythnos, unlike most of the other Cycladic islands, was not a prolific minter of coins, but a hoard has been found suggesting at least one issuance of Kythnian minted coins in the late Archaic period.[441]


***Figure 4.19 Kythnos. From Google Earth.***

[440] Hdt 8.46; Meiggs 1972, 558-9.
[441] Sheedy and Papageorgiadou 1998, 650, n5.

#### 4.2.3.3 Economy

The metallurgical processing facility at Skouries is a prime example of additive economic activity. Skouries demonstrates an organizational plan with some sense of specialization (see Fig. 4.20). Smelting activities date from the Early Cycladic period and took place on top of an exposed cliff-top where strong winds could push oxygen, like a bellows does, into the smelting furnaces, driving temperatures higher. The slag consisted of large densely distributed pieces, coagulated in places.[442] On the other side of the high rock, in a sheltered position, were found scattered pieces of slag, stone hammers, coarse pottery, and some obsidian blades. Probably this is where the slag was broken apart and the metal extracted. Traces of circular buildings exist, one of which was excavated.[443] A small bowl furnace with copper slag was found as well. Stos-Gale suggested that in The Early Bronze Age, most ore deposits were readily found on the surface or near the surface in out-crops suggesting the effort to find and establish a smelting site was probably greater than finding the ore (see Figs 4.20, 4.21).[444] Lead isotope testing of the slag found at Skouries indicate the presence of ores coming from different islands.[445] This suggests that Kythnos was a metallurgical processing centre and that ores were imported for metal extraction, or perhaps custom processed for a fee (such as is done with olive oil processing).[446] The recovery rate of copper from surface ore was surprisingly high. Cuprite ($Cu_2O$) deposits produced 800 gm of metal per one kg of ore, Tenorite (CuO) and Copper sulphides (CuS) deposits yielded 700 gm of metal per one kg of ore. Easier to smelt than sulphides, pure malachite and azurite yielded 50% metal to ore from which one kg of such rich

[442] Stos-Gale 1998, 719.
[443] *Ibid.*
[444] Stos-Gale 1998, 723.
[445] Stos-Gale 1998, 723-4, Table 3.
[446] Stos-Gale 1998, 727.

ores would yield enough metal to make five Cycladic daggers.[447] The extension of smelting activities to Crete as discussed in Chapter 3, section 3.3.2, could be a continuation of the spread of smelting technology from the Cyclades closer to the market for metal items.

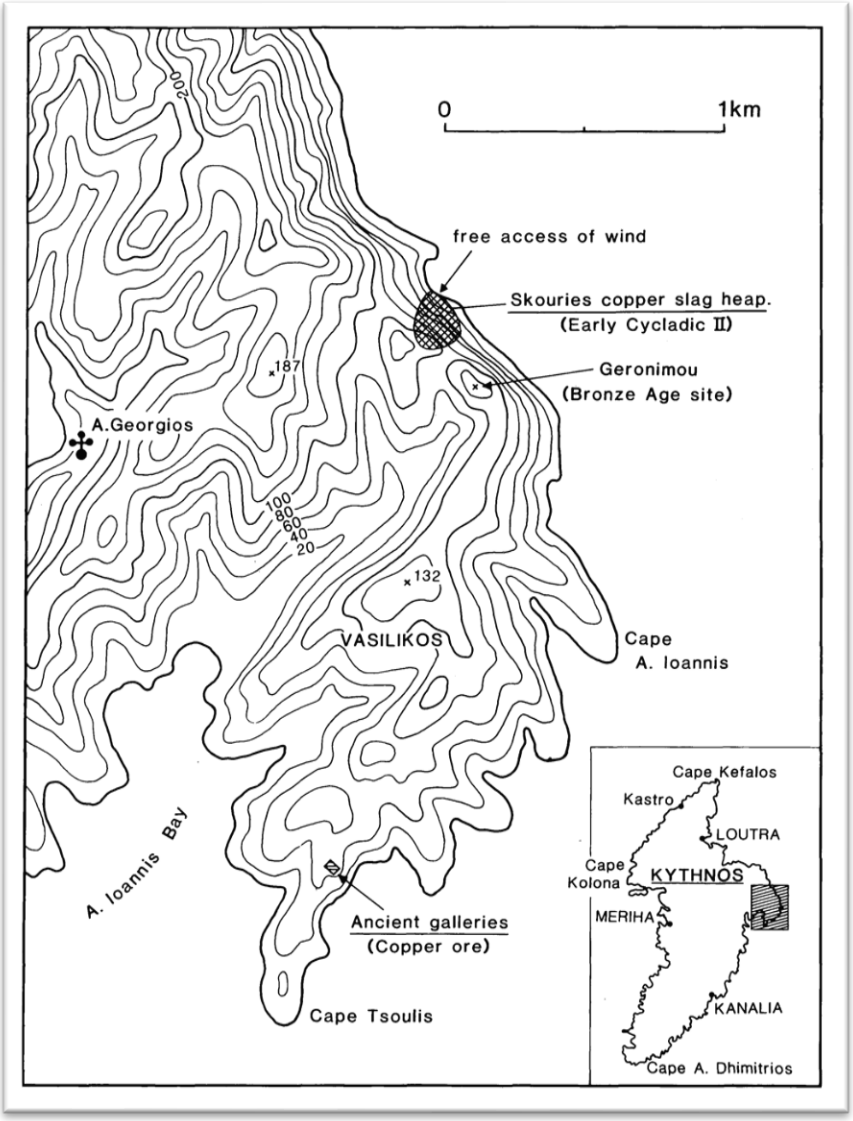


***Figure 4.20 Sketch Map of Skouries on Kythnos. From Stos-Gale 1998, Fig. 2.***

[447] Stos-Gale 1998, 718; Renfrew 2011, 319-20 considered the emergence of daggers and intensive bronze metallurgy almost coterminous.

Evidence of metal processing continued in the Iron Age. As copper deposits were probably played out, the interest changed to separating precious metals, particularly silver and lead from ore (see Fig. 4.21).[448] At Vrykastro, numerous slag and shapeless lumps of various metals throughout the area within the fortifications, with higher concentration of finds in the lower town, were found in a surface survey.[449] Cisterns and water works in the lower part of the town as well as numerous stone pounders and tools found in association were probably related to metal production (see Fig 4.22).

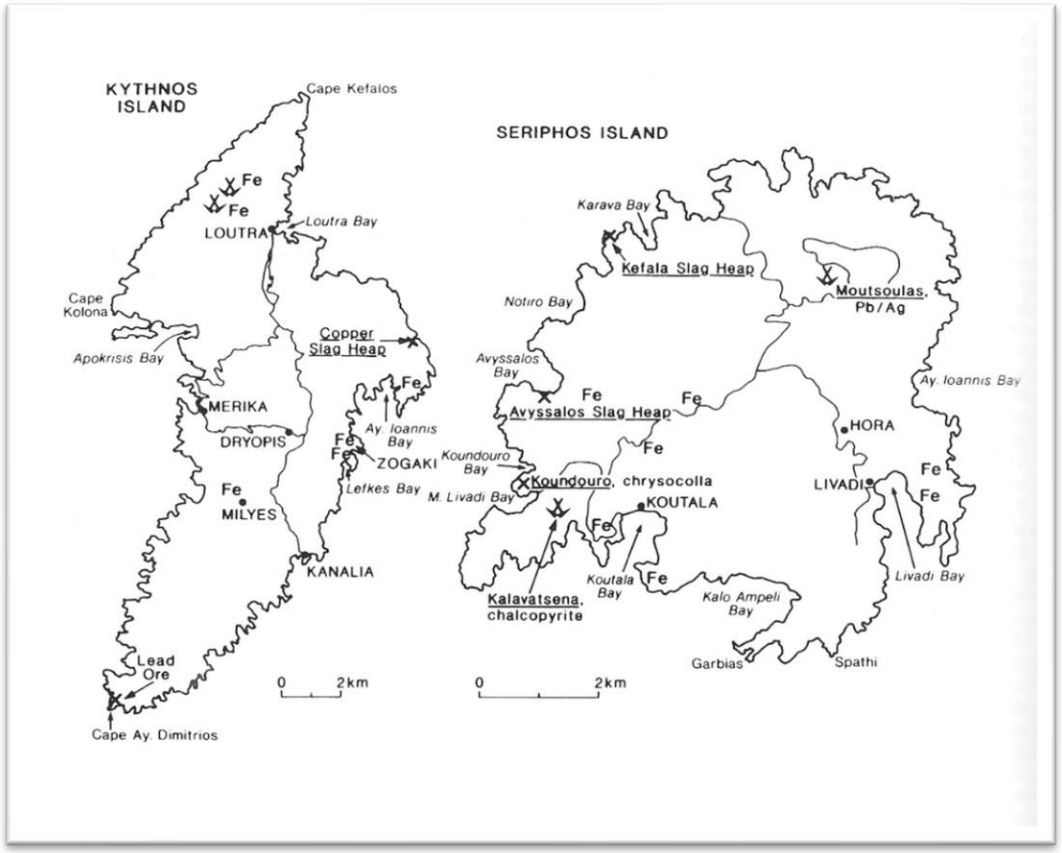


***Figure 4.21 Map of Kythnos and Seriphos showing ore deposits and slag heaps. From Stos-Gale 1998, Fig. 1.***

[448] Stos-Gale 1998, 722, lead probably came from Lavrion in Attica; Gale and Stos-Gale 1981.
[449] Mazarakis Ainian 1998, 376.

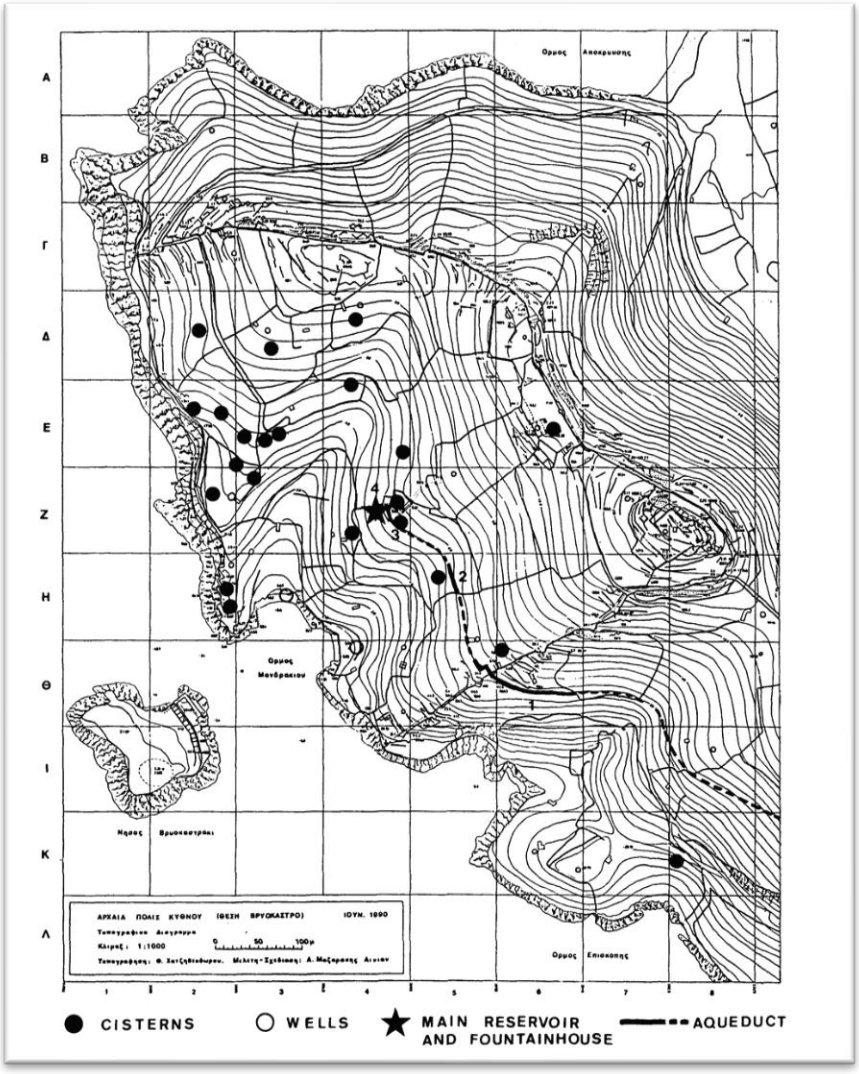


***Figure 4.22 Cisterns, Wells, and Fountain house at Vrykastro. From Mazarakis Ainian and Gounaris 1998, 425, Fig. 52.***

An Archaic temple was found on the middle terrace of Vrykastro (see Fig. 4.23). The temple consists of two rooms, each 2.9 m wide by 8.5 m long, separated by a common wall.[450] In the southern room was an *adyton* measuring 2.0 m by 2.9 m. The temple seems to have been destroyed by an earthquake as the floor level is covered by a layer of roof tiles. The finds from the temple come from wide-ranging

[450] Mazarakis Ainian 2005, 90-3.

provenances suggesting significant foreign contact. Ceramics from the *adyton* included Parian, Chian, East Greek bird bowls, Corinthian, and Attic black glazed items. Shapes cover an array of items such as plemochoai, pyxides, aryballoi, alabastra, and kylixes.[451] Jewellery finds consisted of amber, carnelian, rock crystal, glass paste, faience, and semi-precious stones belonging mostly to necklaces and often with incised representations, one of which was a Late Bronze Age ship. Others included Bronze Age obelisk designs (all found in Early Iron Age contexts suggesting these items were heirlooms). Also found were scaraboids, seals and gems, bone and ivory discs (with sphinx and goat motifs inscribed), as well as a few Egyptian scarabs belonging to 22nd (945-713) and 26th (664-525) Dynasties. Ivory and small bone items (*c.* 300) of which the most common were spectacle fibulae, as well as fibulae of Italic type were among the items uncovered. Metal finds were the largest category from inside the *adyton*. There were about 100 iron and 450 bronze objects recovered. Fibulae suggesting island, Boeotian, and Phrygian origin as well as myriad small pieces were unearthed. More than 120 silver and 75 gold jewels in the forms of fibulae, pins, earrings, rings, rosettes, amulets, and pendants were present.[452] Most of the finds date to 7th and 6th centuries, but there are Protogeometric and Early Geometric pieces which, like the Bronze Age pieces, were probably heirlooms.[453]

[451] Koutsoumpou 2017 discussed the ceramics in detail, she noted (p. 165) there are no finds from Naxos suggesting Kythnos was under some type of Parian zone of influence; Mazarakis Ainian 2005, 96.
[452] Mazarakis Ainian 2005, 96-9 and Plates.
[453] Koutsoumpou 2017; Mazarakis Ainian 2005, 99.

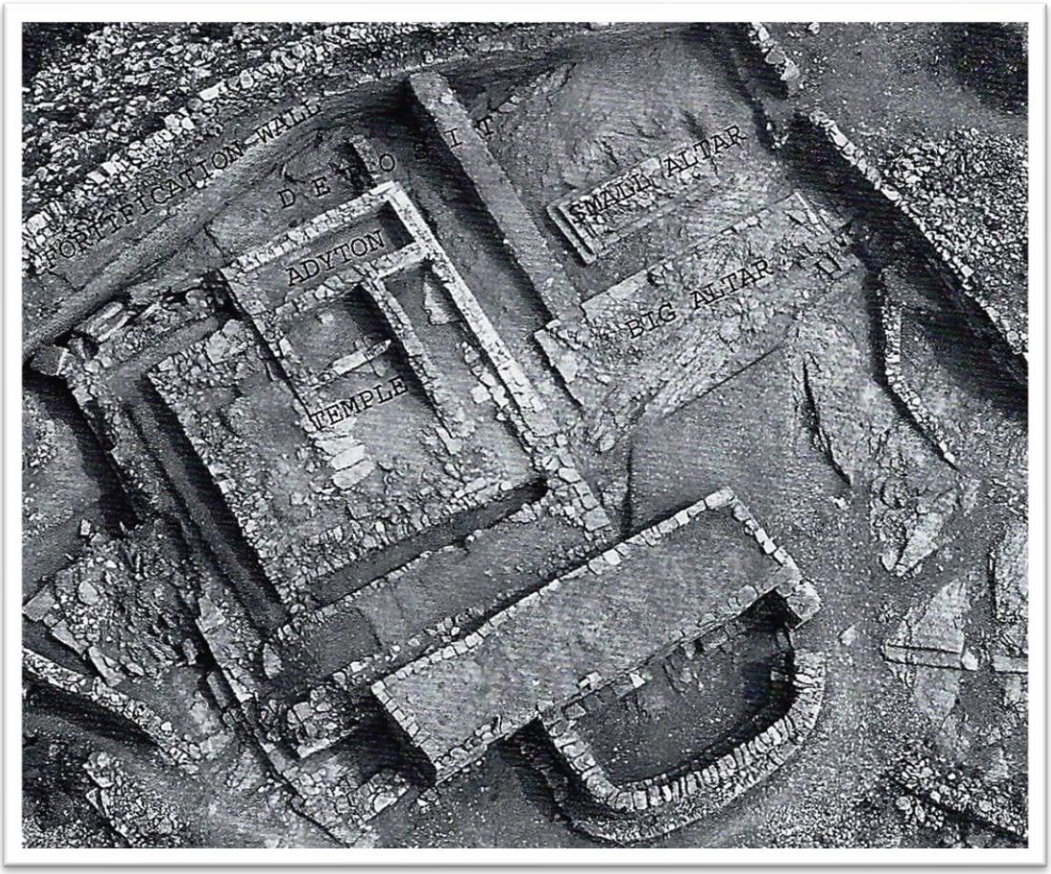


***Figure 4.23 Archaic Temple with Adyton. From Koutsoumpou 2017, Fig. 16.2.***

Within the fortification wall are several other sanctuaries. On the acropolis summit is a temple probably dedicated to Demeter, perhaps as a Thesmophoria. Finds from this temple date from Late Geometric through to Roman period with most dated to Archaic and Classical periods. Finds include Corinthian and Attic pottery as well as Rhodian and East Greek type multi-nozzle lamps.[454] On the middle terrace are two other structures, tentatively identified as having religious functions, from the presence of altars and stele found in association and dedicated to the Gods of Samothrace.[455]

[454] Mazarakis Ainian 2005, 100.
[455] Mazarakis Ainian 2005, 100-1; *IG* XII 5, 1057.

The wealth and range of the finds at Vrykastro covering such a wide range of provenances suggests strongly that Kythnos was an important place of contact and probably trade. The number of sanctuaries dedicated to various deities also suggests that Vrykastro would have been well know and perhaps a place of visitation for foreigners.[456]

#### 4.2.3.4 Summary

Kythnos is remarkable for its early history of metallurgy. Arguably, it was a Bronze Age processing centre for both Kythnian and imported ores. Perhaps they even exported their metal processing technology to Crete. Evidence suggests that this area of specialization continued in the Iron Age even with a turn-over of population between the Bronze and Iron Ages. The island population concentrated into the site at Vrykastro in what appears to have been a peaceful synoecism early in the Iron Age. The capital developed into a large centre capable of financially supporting extensive cult activities at the several temples in Vrykastro. The additive economic practices of the Kythnian population seems to have added significant wealth to the island. The necessity of the extensive fortification walls and the large tribute contributions to the Athenians speak to their collective success (see Table 1). Given their apparent wealth, the 'quiet' historical record of Kythnos compared to other Cycladic islands is curious.[457]

[456] Mazarakis Ainian 2005, 101.

[457] Koutsoumpou 2017, 160 suggested the excavations at Vrykastro are revealing a significant city which better fits the archaeological record than the reputation Demosthenes expressed (13.34) regarding the island's political insignificance.

### 4.2.4 Seriphos

The economic fortunes of Seriphos are diachronically the opposite of neighbouring Siphnos. Siphnos was spectacularly successful in the Archaic period from the output of its silver and gold mines, while in the Archaic period, Seriphos was believed to be an underdeveloped backwater. The reverse occurred in the Hellenistic period when the iron mines of Seriphos were productive and Siphnos's mines had run out. The archaeological record for Seriphos in the Geometric and Archaic periods is poor.[458] As the economic development of Seriphos occurred after the period under investigation, comments will be brief.

Seriphos is about the same size as Siphnos, 75 km², mountainous with only 8.3 km² (11%) of arable land, with a high point of 583 m (see Table 2). Mining activity for pockets of copper ore occurred in the Early Bronze Age in the north of the island centred on the Kephala peninsula (see Fig. 3.5). Mining activity ceased by the Middle Bronze Age and did not begin again until the Late Classical period carrying on into the Hellenistic, when extensive iron ore deposits in the south of the island on the Kyklopas peninsula and above Koutalas Bay were exploited. Iron ore mining continued on Seriphos more or less continuously until World War II.[459]

The modern Chora, located on top of a 200 m hill northwest of the large bay of Livadi on the east of the island, is thought to be on the site of the ancient city as a few ancient blocks can be seen in later construction.[460] Chora has not been systematically excavated or the area formally surveyed. Rescue excavations in the Chora area have uncovered primarily Hellenistic and Roman structures.[461] A network of Hellenistic towers were built proximate to the mines plausibly to

[458] Mazarakis Ainian 1997, in his exhaustive compilation of Geometric period 'big houses' made no mention of Seriphos.
[459] McGilchrist 2010(19), 110-2.
[460] Sheedy 2006a, 47, n325.
[461] *AR ID* 4789, 5860, 5395.

provide security.[462] The Hellenistic towers of Psaros and Aspro Pyrgos are rectangular unlike the circular Archaic period towers built on Siphnos (discussed below).[463]

Despite being a by-word for poverty and irrelevance (Plut. *Mor.* 7.185C; Aristophanes *Acharnians,* 542), the islanders were assessed two talents by the Delian League in 451/450.[464] The size of the contribution suggests that the comments of Plutarch and Aristophanes should be taken with caution.

## 4.2.5 Siphnos

### 4.2.5.1 Introduction

Siphnos held an interesting reputation in Classical and Later Antiquity. The inhabitants of Siphnos were described by Herodotus (3.57) as καὶ νησιωτέων μάλιστα ἐπλούτεον (the richest of the islanders) due to the output of their gold and silver mines.[465] Yet Demosthenes (13.34) writing just a century later in the mid-4th century, cautioned Athenians against becoming too prideful as the Siphnians had been:

> εἰ μὲν οὖν Σιφνίοις ἢ Κυθνίοις ἤ τισιν ἄλλοις τοιούτοις οὖσι συνῄδειν ὑμῖν, ἔλαττον φρονεῖν συνεβούλευον ἄν·
>
> But if I felt you were Siphnians or Kythnians, or people of that sort,
> I would counsel you to be less proud.

[462] McGilchrist 2010(19), 109, 113.
[463] *AR ID* 4752.
[464] Meiggs 1972, Appendix 14, Table 5, item 14; Meritt, Wade-Gery, and McGregor 1950, 123.
[465] In the *Suda*, a 10th c. AD Byzantine lexicon, anonymously compiled, the Siphnians were recorded as; "These people were the wealthiest of islanders, richer than a great many of the mainlanders."

Their ancient reputation was a cautionary tale regarding hubris as the islander's good fortune turned sour due, in the ancient's opinion, to profligate spending and inattention to divine commitments. Pausanias (10.11.2; trans P. Levi) commented;

> Σιφνίοις ἡ νῆσος χρυσοῦ μέταλλα ἤνεγκε, καὶ αὐτοὺς τῶν προσιόντων ἐκέλευσεν ὁ θεὸς ἀποφέρειν δεκάτην ἐς Δελφούς….ὡς δὲ ὑπὸ ἀπληστίας ἐξέλιπον τὴν φοράν, ἐπικλύσασα ἡ θάλασσα ἀφανῆ τὰ μέταλλά σφισιν ἐποίησεν.
>
> The island of Siphnos yielded goldmines, and the god commanded them to bring a tithe of the produce to Delphi…. when out of insatiable greed they gave up this tribute, the sea flooded in and obliterated the mines.

This reputation of living beyond their means was enhanced from the construction of defensive walls around the capital (Kastro) out of marble, and public buildings from Parian marble.[466] (Hdt. 3.57.4 τοῖσι δὲ Σιφνίοισι ἦν τότε ἡ ἀγορὴ καὶ τὸ πρυτανήιον Παρίῳ λίθῳ ἠς ἠσκημένα).

The physical evidence suggests a more nuanced reputation is appropriate, and one must keep in mind that themes of morality were often incorporated in the works of ancient authors.

Siphnos is the fourth island (north to south) in the western string (see Fig. 4.1). It is small (73 km²), and mountainous (high point 682 m) with agricultural land limited to 13.3 km², 18% of the island's area (see Table 1). There are several harbours reasonably sheltered from strong winds (from north to south: Cheronisos, Vroulidia, Kamares, Pharos, Platy Yialos, and Vathy) but they are small

[466] Sheedy 2006b, 68 on marble sources for these buildings. He suggested the statuary and adornments were Parian and the building stone Siphnian.

and can only accommodate five or six boats at a time. The island has no large harbour such as on Kea, Kythnos, or Paros. Kastro is on the eastern shore and the harbour associated with it is very small. Siphnos is close to Paros, only 19 km west (typically perpendicular to the prevailing wind so reasonably accessible) and Parian pottery makes up a considerable proportion of the assemblages, whereas Naxian is rare.[467]

Ancient tradition as recorded by Stephanos of Byzantium, listed three Archaic cities on Siphnos; the *asty* of the Siphnians (Kastro), Minoa, and Apollonia (see Fig. 4.24). The settlement at Aghios Andreas is considered by some to have been Minoa. Apollonia has not been located.[468] Aghios Andreas is currently being excavated by Televantou. Kastro was inhabited continuously from 8th century to present. Only a few lots within the modern city have been excavated. Brock and Mackworth Young worked on the site just prior to WW II and published their findings in 1949.[469] In addition to the settlement sites, a network of 55 towers existed of which the remains of 51 have been identified.[470] Numerous mines are found on the island as well as fortifications at Aghios Nikitas and Prophitis Elias Troulakiou, probably built in association with the mines.[471]

[467] Brock and Mackworth Young 1949, 34; Kastro to Paroikia 38 km, Kastro to Despotiko 22 km.
[468] Televantou 2008b, 39 suggests Aghios Andreas was probably Minoa.
[469] Brock had to make a very hasty exit in April 1941 and some notes and maps were mislaid during the evacuation. Significant amounts of the excavated material 'disappeared' during the War while under the charge of the Italian garrison commander, who took finds into his own possession for 'safekeeping.' A few items were subsequently purchased on the open market and are now at the Benaki. See Brock and Mackworth Young 1949, Foreword.
[470] Ashton and Pantazoglou 1991, 26, 28-9.
[471] Televantou 2008b, 44, 48-9.


***Figure 4.24 Map of Siphnos. From Google Earth.***

Blue circle over silver mining area, red circle over gold and silver.

### 4.2.5.2 History

Excavation evidence suggests that the island was inhabited in the Early Bronze Age, Late Bronze Age, and continuously after the 8th century with population gaps in the Middle Bronze Age and Protogeometric periods. Some Early Bronze Age

pottery has been recovered from the citadel at Kastro.[472] Pottery dated to first half of 3rd millennium has been found in association with the Aghios Sostis mines, but only with these mines. Pottery from all other mines date from Archaic period, or later.[473]

## *Aghios Andreas*

The fortified site of Aghios Andreas dates from 13th century and was abandoned at the end of 12th or early 11th century. The site was re-inhabited in the 8th century and had its largest area of occupation from 7th to 5th centuries. After the 5th century, the occupied area was greatly reduced, and the site largely deserted. Cult activity continued to 2nd century evidenced by Hellenistic material.[474] The settlement, was strategically sited in the centre of the island and was plausibly a key node in intra-island communication networks (see Fig. 4.24).[475] A 12th century outer defensive wall constructed of hewn stones quarried from the bedrock in front of the wall surrounded an earlier 13th century wall built from Cyclopean boulders (see Fig. 4.25). Eight strong-points (that may have been towers) re-enforced the defensive aspect of the fortifications.[476] Late Bronze Age building walls occur throughout the area inside the fortifications, all found under later constructions.[477] The Geometric settlement clustered along the north wall and grew to cover the entire enclosed area.[478] Most finds in the north settlement area date to 8th century.[479] Building complex A, consisted of fifteen rooms covering 390

[472] Televantou 2008b, 37.
[473] Televantou 2008b, 52; Gale and Stos-Gale 1981, 201-2, C-14 tests conducted on charcoal finds corroborated pottery dating to Early Bronze Age and Archaic mining phases; Wagner, Gentner, Gropengiesser, and Gale 1980, 25-9.
[474] Televantou 2008b, 18, 42-3; Gounaris 2005, 22, 52.
[475] Televantou 2008b, 57, Fig. 85a.
[476] McGilchrist 2010, 159-9; Televantou 2008b, 18.
[477] Televantou 2017, 369; 2008b, 19-25.
[478] Televantou 2017, 367; 2008b, 25, 42-3; Mazarakis Ainian 1997, 255.
[479] Televantou 2008b, 89, Figs 131, 133.

m², had finds dating from 6th to 2nd century.[480] On the south-side of the settlement, a sanctuary was constructed over several phases. Phase 1 dated to second half of 8th century. This temple was 13.5 m long by 8.30 m wide, oriented northwest to southeast, and constructed from very neat masonry of small schist blocks. In the 6th century, the sanctuary was remodelled. An enclosure wall was built of beautiful white limestone in a pseudo-isodomic system with large blocks cut obliquely. This was the only structure built with white limestone at Aghios Andreas. The building technique was the same used at Kastro in the construction of the marble fortification wall and at the fortification of Aghios Nikitas.[481] The phase 2 temple was built in an east/west orientation on top of the phase 1 temple. Only a few sections of the phase 2 temple survive. The oldest finds from the sanctuary dated to 8th and 7th centuries, consist of vases, figurines, stone and metal jewellery, and seals. Finds from 5th to 2nd centuries were found in upper levels associated with the phase 2 temple.[482]

[480] Televantou 2008b, 90, Fig. 136.
[481] Televantou 2017, 367.
[482] Televantou 2017, 372-3, Figs 11-15.


***Figure 4.25 Site Plan of Aghios Andreas. From Televantou 2017, Fig. 4.***

## *tis Baronas to Froudi*

On a rocky outcrop above the bay of Vathy in the Kalamitsi area, is the site of 'tis Baronas to Froudi' dated late 12th to early 11th century (see Fig. 4.26).[483] Buildings are on terraces on the west and south slopes. The houses are enclosed by a wall. Pottery surface finds date to LH IIIC and consist mostly of monochrome black-

[483] Vlachopoulos and Mercourios 2015, 345.

glazed ware with the bell skyphos the most common shape. Tis Baronas to Froudi has been interpreted as the only true LH IIIC refuge site in the Cyclades. Its habitation dated after the Late Bronze Age abandonment of Aghios Andreas, and the site is naturally protected with restrictive access.[484]

***Figure 4.26 Tis Baronas to Froudi. From Vlachopoulos 2008b, Fig. 43.22.***

## *Kastro*

Kastro perches on top of an acropolis on the eastern shore (see Fig. 4.24). The Kastro area is heavily built-on, restricting excavations to small vacant plots. Early to Middle Bronze Age pottery found on the acropolis area indicated a small

[484] Vlachopoulos and Mercourios 2015, 345-6; Vlachopoulos 2008b, 490; *AR ID* 1306.

settlement existed on the acropolis.[485] There are no finds of Late Bronze Age or Protogeometric ceramics, nor much Early Geometric material.[486] A fortification wall built from marble (probably quarried locally) dated to the end of 6th century by comparanda mentioned above.[487] Geometric material is found only from six excavation squares within the enclosure at the northwest corner, and on the northeast and southwest slopes of the acropolis (see Fig. 4.27). Late Geometric and Archaic finds were plentiful. Brock commented that everywhere on the hill of Kastro are random sherds from Geometric through to Roman period demonstrating continuous habitation from the 8th century.[488]

Three Late Geometric houses were excavated at the northwest corner enclosed by the fortification wall roughly in line with the cliff face. The walls were 0.40 m thick except for the south walls which were 0.70 m thick suggesting that these walls may have formed part of an earlier fortification wall. Finds along the south walls dated to early 8th century.[489] A fragment of a marble Doric column is the only surviving evidence of finer architecture on the Kastro summit, dated by fluting design to 5th century.[490] Rescue excavations have exposed another section of the fortification wall in the northeast corner.[491] On the northeast slope of the acropolis, outside the defensive wall are a few walls from three Geometric houses. Pottery from an undisturbed deposit, including a few sherds of Melian ware, dates to mid-8th century. On the southwest slope of Kastro hill, a cemetery was

[485] Brock and Mackworth Young 1949, 31.
[486] Brock and Mackworth Young 1949, 31-3; Mazarakis Ainian 1997, 251 on lack of evidence for continuous habitation.
[487] Sheedy 2006b discussed the walls and Brock's excavations; Brock and Mackworth Young 1949, 2. Brock remarked that a marble fortification wall "must have been a flamboyant gesture."
[488] Brock and Mackworth Young 1949, 18.
[489] Brock and Mackworth Young 1949, 8-9, Fig. 1; Mazarakis Ainian 1997, 255, Fig. 290 (copy of Brock's diagram).
[490] Brock and Mackworth Young 1949, 10.
[491] *AR ID* 3246, 3247, 3249, all from 2004.

unearthed but graves had been either rifled or destroyed by cultivation. Sherds in the cemetery area dated from 7th century to Roman period.[492]

As mentioned, small finds were numerous, particularly from a votive deposit found in association with the Geometric houses within the fortification enclosure.[493] Ceramics were typical of Late Geometric iconography, with concentric circle decorations, wavy lines and chevrons, and birds.[494] Several sherds from Parian Amphorae were found while only one sherd could be assigned to Naxos.[495]

[492] *AR ID* 3250.
[493] Brock and Mackworth Young 1949, 31-62 detailed pottery catalog, Plates 6-20.
[494] Brock and Mackworth Young 1949, Plate 12, items 12, 17, 30, 34; Plate 13, items 8, 9; Plate 14, items 27, 30, 31.
[495] Brock and Mackworth Young 1949, 34-6.

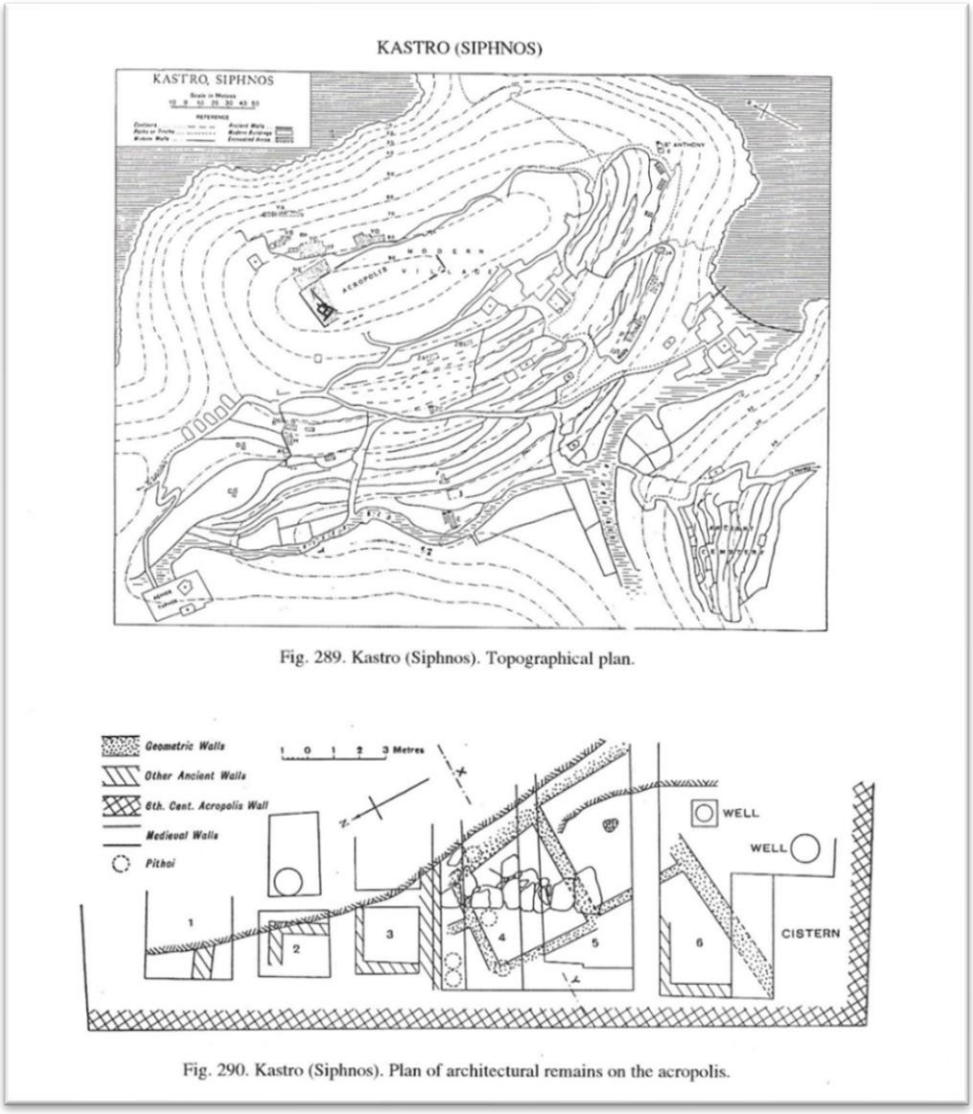


***Figure 4.27 Plan of Kastro at Siphnos and Geometric House Plans. From Mazarakis Ainian 1997, Figs 289, 290.***

## *Towers and Fortresses*

A distinguishing characteristic of Siphnos is an extensive network of towers across the island. There are 200 known towers in the Aegean, 55 of them on Siphnos.

Thasos is second with 33 and Keos third with 27.[496] All three islands had extensive mine works. The tower systems may be indicative of centralized authority associated with protecting mining activities. On Siphnos, the towers were built over a three-century span, the earliest dated to end of 6th century, after the Samian raid in 525. The earliest towers were built near the mines and probably served as watch towers and strong-holds in which to store extracted ore. The early towers had strongly built door-ways and secure bolts for locking doors, best seen on the White Tower above Platys Yialos.[497] Approximately twenty of the towers were visible from Aghios Andreas, both in the silver mining zone to the north and in the gold mining zone to the south (see Fig. 4.24).[498] Televantou suggests the towers served as phryctories, transmitting messages via signal fires.[499] On Siphnos all of the towers are of circular construction, at least two stories high, with an internal corbeled staircase, and ranged in diameter from 4.0 to 13.5 m.[500] Towers built after the mining boom were located near water sources on agricultural land. These may better be characterized as refuges or barns than watchtowers.[501]

Completing the watch system for the mines were two fortresses. Aghios Nikitas is west of the mines at Aghios Sostis, located where the northern and eastern approaches to the island could be observed. On the opposite side of the valley, the fortress Prophitis Elias Troulakiou overlooked the western approaches. The two fortresses are clearly visible to one another.[502] Aghios Nikitas had some Late

[496] Ashton and Pantazoglou 1991, 26, catalog of towers 28-29.
[497] Ashton and Pantazoglou 1991, 26; McGilchrist 2010(19), 165.
[498] Televantou 2008b, 59-61, Fig. 85β is a diagram showing line of site network coverage between towers.
[499] Televantou 2008b, 56.
[500] Televantou 2008b, 55; Ashton and Pantazoglou 1991, 26.
[501] Ashton and Pantazoglou 1991, 26.
[502] Televantou 2008b, 44; McGilchrist 2010(19), 151-2.

Bronze Age pottery in the area, but the building masonry and stonework for both sites dated to end of 6th century.[503]

Herodotus (3.57) recorded a raid on Siphnos in 525 or 524 conducted by refugees from Samos escaping the tyrant Polycrates. The Samians eventually managed to extract 100 talents from the Siphnians. The late 6th century construction date for many of the towers and the fortresses suggests the defensive systems were put in place, or strengthened considerably, as a result of this raid. Herodotus's passage provides information on multiple aspects of Siphnian society.

> 3.57. Οἱ δ᾽ ἐπὶ τὸν Πολυκράτεα στρατευσάμενοι Σαμίων, ἐπεὶ οἱ Λακεδαιμόνιοι αὐτοὺς ἀπολιπεῖν ἔμελλον, καὶ αὐτοὶ ἀπέπλεον ἐς Σίφνον, χρημάτων γὰρ ἐδέοντο, τὰ δὲ τῶν Σιφνίων πρήγματα ἤκμαζε τοῦτον τὸν χρόνον, καὶ νησιωτέων μάλιστα ἐπλούτεον, ἅτε ἐόντων αὐτοῖσι ἐν τῇ νήσῳ χρυσέων καὶ ἀργυρέων μετάλλων, οὕτω ὥστε ἀπὸ τῆς δεκάτης τῶν γινομένων αὐτόθεν χρημάτων θησαυρὸς ἐν Δελφοῖσι ἀνάκειται ὅμοια τοῖσι πλουσιωτάτοισι· αὐτοὶ δὲ τὰ γινόμενα τῷ ἐνιαυτῷ ἑκάστῳ χρήματα διενέμοντο. ὅτε ὧν ἐποιεῦντο τὸν θησαυρόν, ἐχρέωντο τῷ χρηστηρίῳ εἰ αὐτοῖσι τὰ παρεόντα ἀγαθὰ οἷά τε ἐστὶ πολλὸν χρόνον παραμένειν· ἡ δὲ Πυθίη ἔχρησέ σφι τάδε.
>
> "Ἀλλ᾽ ὅταν ἐν Σίφνῳ πρυτανήια λευκὰ γένηται λεύκοφρύς τ᾽ ἀγορή, τότε δὴ δεῖ φράδμονος ἀνδρός φράσσασθαι ξύλινόν τε λόχον κήρυκά τ᾽ ἐρυθρόν."

[503] Televantou 2008b, Figs 60-62; McGilchrist 2010(19), 152-3.

τοῖσι δὲ Σιφνίοισι ἦν τότε ἡ ἀγορὴ καὶ τὸ πρυτανήιον Παρίῳ λίθῳ ἡσκημένα.

3.58. Τοῦτον τὸν χρησμὸν οὐκ οἵοί τε ἦσαν γνῶναι οὔτε τότε εὐθὺς οὔτε τῶν Σαμίων ἀπιγμένων. ἐπείτε γὰρ τάχιστα πρὸς τὴν Σίφνον προσῖσχον οἱ Σάμιοι, ἔπεμπον τῶν νεῶν μίαν πρέσβεας ἄγουσαν ἐς τὴν πόλιν. τὸ δὲ παλαιὸν ἅπασαι αἱ νέες ἦσαν μιλτηλιφέες, καὶ ἦν τοῦτο τὸ ἡ Πυθίη προηγόρευε τοῖσι Σιφνίοισι, φυλάξασθαι τὸν ξύλινον λόχον κελεύουσα καὶ κήρυκα ἐρυθρόν. ἀπικόμενοι ὧν οἱ ἄγγελοι ἐδέοντο τῶν Σιφνίων δέκα τάλαντά σφι χρῆσαι· οὐ φασκόντων δὲ χρήσειν τῶν Σιφνίων αὐτοῖσι, οἱ Σάμιοι τοὺς χώρους αὐτῶν ἐπόρθεον. πυθόμενοι δὲ εὐθὺς ἦκον οἱ Σίφνιοι βοηθέοντες καὶ συμβαλόντες αὐτοῖσι ἐσσώθησαν, καὶ αὐτῶν πολλοὶ ἀπεκληίσθησαν τοῦ ἄστεος ὑπὸ τῶν Σαμίων, καὶ αὐτοὺς μετὰ ταῦτα ἑκατὸν τάλαντα ἔπρηξαν.

3.57: Just as the Lacedaemonians were about to abandon them, the Samians, who had just started this war against Polycrates, sailed away to Siphnos because they needed money; and at that time, due to the gold and silver mines on their island, the Siphnians had reached the peak of their prosperity and had become the wealthiest of all the islanders. Indeed, the mines were so productive that the tithe deposited in the Siphnian treasury at Delphi was the equal to that of the wealthiest treasuries. Each year, the Siphnians divided the profits from the mines among themselves. While they were building their treasury, they consulted the oracle about whether their present prosperity would last a long time. The Pythia replied:

> When the city hall is white
> And the agora white-browed, then should the wary man
> Beware: of wooden ambush and a herald in red.

At that time, both the agora and the city hall of the Siphnians were adorned with Parian marble.

> 3.58: The Siphnians were unable to interpret this oracle, neither immediately after it was given nor later when the Samians came. For as soon as the Samian ships put in at Siphnos, they sent ambassadors in one of their ships to the city. Now in the old days all ships were painted red, and so this was precisely what the Pythia had predicted to the Siphnians when she bade them beware of wooden ambush and a herald in red. When the ambassadors arrived at the city of the Siphnos, they requested a loan of ten talents from the Siphnians, but the Siphnians denied their request. The Samians then proceeded to ravage the island. When the Siphnians found out about this, they armed themselves without delay and ran out to defend their land. In the battle that followed, the Siphnians were defeated, and after this was over, many of them found themselves cut off from the town by the Samians, who were then able to extract 100 talents from the Siphnians.[504]

If Herodotus's date for the Samian raid is correct, the monumentalization of the city centre and the construction of the Siphnian treasury in Delphi (built *c.* 535), both done in Parian marble, occurred prior to the Siphnians investing in a defensive network for the protection of their assets. Dating the development of a

[504] Trans. by A. Purvis.

defensive network following this event seems logical and is supported by the archaeology. The Samian raid also marks the turning point for the mine productivity. Throughout the 5th century, production levels seem to have declined.[505] In the Athenian assessment of the Delian League in 450-449 the Siphnians were assessed 3 talents. This was raised in 425-424 to 9 talents in the general increase demanded by Athens (see Table 1). Compared to Paros at 30 talents and Naxos at 15, the Siphnians contribution was modest.[506] By late-5th century with mine output reduced, the Siphnians were no longer the "wealthiest of all the islanders."

#### 4.2.5.3 Economy

Siphnos is arguably one of the best examples of an additive economic strategy. With only 18% of the island's land considered arable, the islanders aggressively exploited their mineral resources, opening mines across the island in the Late Geometric and Archaic periods.

The geology of Siphnos is similar to Attica and the other western Cycladic islands, a crystalline complex of marbles, gneisses, and schists. On Siphnos, the mineral deposits cluster in two spots, a band of lead and silver bearing rock that stretched across the north of the island from Aghios Sostis to the Bay of Tsocha on a bearing of 220°, and a cluster of gold bearing rock in southeast of the island above the Bay of Platys Yialos (see Fig. 4.24, silver mine area in blue, gold in red).[507] Five mining sites exploited the northern seam; Aghios Sostis, Aghios Silvestros, Vorini,

[505] Sheedy 2006a, 52; Gale and Stos-Gale 1981, 196 only the Aghios Sostis mines had flooded galleries, all others were above sea-level, these mines were simply played out for lead/silver. In mid-19th c., the ancient galleries were blasted open in iron ore mining operations, often destroying the ancient tunnels.
[506] Meiggs 1972, Appendix 14, Table 5, item 15; Meritt, Wade-Gery, and McGregor 1950, 124.
[507] Televantou 2008b, 48-9, 51, Fig. 71; Wagner and Weisgerber 1985, 59-80, 230; Gale and Stos-Gale 1981, 195-208, Fig. 8 map of silver mine locations.

Kapsalso, and Xeroxylon.[508] Evidence of mine shafts, ventilation shafts, and tailings are plentiful. Some of the mine entrances at Aghios Sostis are at or very near sea level, leading to galleries that run below sea level. These galleries were prone to flooding, in concert with Pausanias's comment on the god flooding the mines because the Siphnians were not making their promised tithe.[509] Mines in the south are entered at Aghios Ioannis, Apokofto, and Aspro Pyrgos. As mentioned, pottery found at the mine locations dated to 6th and 5th centuries primarily; except for Aghios Sostis where some Early Bronze Age sherds, obsidian flakes, and stone hammers were uncovered.[510]

Large cavities near the mines suggest smelting furnaces.[511] Yet, evidence of smelting or litharge (extracting silver from lead via reduction and cupellation) is not plentiful, especially relative to the amount of material removed from the mines.[512] The Siphnians seems to have exported silver bearing ore to Aegina, Athens, and Corinth as assay testing has found Siphnian silver in coinage issues from all three.[513] Speculatively, a lack of wood fuel on Siphnos for the volume of smelting required could explain this. Bresson remarked that at Lavrion, to smelt enough ore to produce one ton of silver required charcoal from 10,000 tons of wood to fire the furnaces.[514] Charcoal produces more heat than dry wood (1.65:1.0 per unit of weight), but there is an energy loss in the conversion as it takes 5 units of dry wood to make 1 unit of charcoal.[515] Cupellation of ore to

[508] Sheedy 2006a, 52; Wagner, Gentner, and Gale 1980.
[509] Wagner and Weisgerber 1985, 81-112.
[510] Televantou 2008b, 43, 51; Sheedy 2006a, 52; Gale and Stos-Gale 1981, 199, Plate 39a.
[511] Televantou 2008b, 53.
[512] Wagner and Weisgarber 1985, 231; Gale and Stos-Gale 1981, 197, 202, Fig. 9, Fiedler visited the mines in 1840s before iron ore extraction began. He noted scattered hazelnut size pieces of slag near Aghios Sostis mines and some pieces of litharge near Platys Yialos. Most evidence of cupellation furnaces are from north side of peninsula where Aghios Sostis mines are.
[513] Sheedy 2006a, 42, n286.
[514] Bresson 2016, 73, n6.
[515] Bresson 2016, 74-5.

extract metal requires a temperature of 1100-1200 degree Celsius, achievable only with the higher heat of charcoal and a bellows system.[516] Silver recovery from ore on Siphnos was about the same as from the mines at Lavrion, between 0.1-0.5%.[517] Using 0.3% (as a mid-range recovery value); producing one ton of silver required the melting of 333 tons of ore which required about 2,000 tons of charcoal, a ratio of 6 tons of charcoal per 1 ton of ore.[518] It seems unlikely that the 73 km² island of Siphnos could have produced enough wood to make such a volume of charcoal. Arguably, the distance of Siphnos from heavily forested mainland locations made importing the required six metric tons of charcoal for smelting less attractive than exporting one metric ton of ore to be smelted elsewhere (see Fig. 4.1; distances from Siphnos to well-wooded areas: Euboea 140 km, Peloponnesus 190 km, Anatolia 265 km).[519]

The production of bullion or coinage on Siphnos rather than shipping out unprocessed ore, would seem to have been a value-adding strategy, if smelting in volume had been possible. Especially so when output from the mines diminished in the 5th century. Coins were minted on Siphnos as early as 540 making them an early adopter. Sheedy classified these early coins Series I, identified with an eagle on the obverse, of which sixteen coins survive. Sheedy suspected that the minting of Series I coins stopped after the Samian raid with the loss of 100 talents of silver not leaving enough refined silver to continue minting.[520] Series II date from the 470s, stamped with the head of Apollo on the obverse. This too seems to have been a run of limited duration with the latest coins dated to 455.[521] The lack of

[516] Gale and Stos-Gale 1981, 216; Healy 1978, 150.
[517] Stos and Stos-Gale 1981, 198.
[518] Iron smelting occurs at a lower temperature (800 C) yet still required 5 parts of charcoal per 1 part of ore, see Healy 1978, 196.
[519] Healy 1978, 148-52 discussed fuel shortages for smelting in Gaul and Campania (mentioned in Pliny) and the transport of charcoal.
[520] Sheedy 2006a, 47-50.
[521] Sheedy 2006a, 50-51.

fuel resources seems a reasonable explanation for the low level of smelting activity seen in the archaeological record.

Beyond mining, cookware produced from red micaceous Siphnian clay was highly prized for its heat transfer properties.[522] Finds of Siphnian khytra and lopas (casserole) shapes have been made in Late Archaic contexts at Knossos.[523] Fabric analysis of cook pot finds at Ayia Irini on Keos, at Knossos, and at Tocra in North Africa from the Middle Geometric period through to Late Archaic, point to Cycladic red micaceous clay.[524]

#### 4.2.5.4 Summary

The lack of Protogeometric pottery from the settlement sites of Aghios Andreas, Kastro, and tis Baronas to Frondi, or related cemeteries, or surface finds, suggests that Siphnos was deserted or at least nearly deserted, from the end of the 12th or late 11th century until the 8th century. When habitation is again evident, it was in Kastro and at Aghios Andreas where Late Bronze Age architecture was reused. Iron Age mining activity is not visible until the late 7th or early 6th century.

If Herodotus's history can be trusted:[525]

> (Hdt 3.57, see Greek above): Indeed, the mines were so productive that the tithe deposited in the Siphnian treasury at Delphi was the equal to that of the wealthiest treasuries. Each year, the Siphnians divided the profits from the mines among themselves.

[522] Boileau and Whitley 2010, 238-42; Coldstream, Eiring, and Forster 2001, 87.
[523] Coldstream, Eiring, and Forster 2001, 87, Fig. 2.6 items h, k; see also Rutishauser 2012, 74, n148 on Siphnian pottery exports.
[524] Boileau and Whitley 2010, 233-5, 238-42. Note discussion of fabric groups 4 and 7.
[525] The timing for the monumentalization of Kastro is concurrent with that of Paroikia on Paros, *c.* 530 which may help corroborate Herodotus's account. See below discussion on Paros; Ohnesorg 2005; Rubensohn 1917, 2-7; see Sheedy 2006b on Herodotus and Siphnos.

The Siphnians from the Late Geometric period seem to have developed some form of central authority strong enough that it could organize the distribution of proceeds from the mines and undertake public works. Per Herodotus, from the mine proceeds a tithe was paid to Apollo at Delphi and the remainder of the proceeds distributed among the population. This implies that the mines were publicly owned and authority was granted by the people to some organizing authority for their management.[526] Following the Samian raid, a system of watchtowers and fortresses to defend the mines and the island were developed, probably under central authority and with public monies.[527] Public works included the building of the marble fortification wall and civic buildings at Kastro, the Siphnian treasury at Delphi, and the phase 2 temple at Aghios Andreas. These were significant undertakings.

The mines were exhausted by the end of the 5th century.[528] The Siphnians had not developed economic activities beyond mining and, when the mines failed, so did the economic engine of the islanders. Given the island's minimal agricultural land area and lack of an attractive large harbour, alternative options would have been hard to find. The economic decline of the Siphnians became a cautionary tale. A fragment from a lost play of Aristophanes demonstrates how the Siphnians had become the butt of Athenian humour:

> ὑποτείνει δε τις αὐτον βωμολοχεῦσαι αὐτὸς δείξας ἕν (θ') ἁρμονίας Χιάζειν ἢ Σιφναίζειν

[526] Rutishauser 2012, 57 and Sheedy 2006a, 55 argue that we cannot conclude definitively about mine ownership based on this evidence; Neer 2001 306-8 argued ownership of the mines is indeterminate but that the policy of distributing profits amongst the citizens had the effect of leveling the benefits; Latte 1968, 294-312 suggested that mineral resources were public property.
[527] Televantou 2008b, 55-61; McGilchrist 2010(19), 163.
[528] Sheedy 2006a, 52; Gale and Stos-Gale 1981, 196.

> someone decides to make jokes about him when he has shown himself in contracts to act like a Chian or a Siphnian.[529]

Nor had their reputation recovered when centuries later Strabo (10.5.1) wrote:

> Κίμωλος, [.....] ἔνθεν ἡ Σίφνος ἐν ὄψει ἐστίν, ἐφ᾽ ᾗ λέγουσι Σίφνιον ἀστράγαλον διὰ τὴν εὐτέλειαν.
>
> (From) Kimolos […] Siphnos is visible, on account of its worthlessness, people say "Siphnian knucklebone" (cheap dice – derogatory phrase).

Siphnos was the sole Cycladic island where both its economic rise and fall occurred during the period under examination in this thesis.

## 4.2.6 Melos

### 4.2.6.1 Introduction

Melos is the southwesterly most Cycladic island. It is one of the larger islands with an area of 158 km². The island is nearly split in two halves by the large Bay of Melos. Most of the settlement history is concentrated in the northern half of the eastern lobe of the island (see Fig. 4.28). Western Melos is significantly more mountainous while the southern portions have malarial marshes and smelly sulphurous fumaroles. Melos is on the trade route for vessels sailing south (with the prevailing summer wind) from the Saronic gulf through Melos, to western Crete and on to North Africa (Tocra). The island is southwest of the main Attic or Corinthian routes to Asia and is northeast of the routes from Crete to the

[529] Aristophanes, Fragment 912, Line 2, accessed on *TLG*.

Peloponnese which tend to run through Kythera.[530] Since Mesolithic times, Melos was the principle source in the Aegean for obsidian, a volcanic glass from which extremely sharp cutting tools can be made.[531]

Melos can be defined in various ways. Linguistically, Dorian epigrams found on the island suggest it should be included in the Southern Tier (discussed in section 4.5). Geologically however, it shares features and rock types with the western islands. Including Melos with the other islands that exploited their mineral resources seems more efficacious.

Phylakopi is one of the more thoroughly investigated sites in the Aegean. It was initially excavated by the British School in early 1900s by MacKenzie, later in 1970s by Renfrew, Cherry *et al.*, and more recently by Boyd, Brodie, and Sweetman. The results are well published. The town site of Ancient Melos is a different story. This site has been subject to looting over the last three centuries.[532] The island was surveyed extensively in 1976 by Cherry and again by Catling in 1989.[533]

#### 4.2.6.2 History

Phylakopi was inhabited throughout the Bronze Age down to Late Cycladic IIIC (*c.* 1120) when it was severely damaged, possibly by an earthquake.[534] Portions of the site were subsequently re-inhabited but then abandoned for good *c.* 1090.[535] Thereafter, the island seems to have been nearly abandoned for several centuries. There are virtually no finds datable between 1090-900.[536] In the 8th century, a new

[530] Broodbank and Kiriatzi 2014, 44.
[531] See Shelford, *et al.* 1982, 182-220 on the obsidian trade of Melos.
[532] Coldstream 2009, 181.
[533] The survey is fully described in Cherry 1982a and summarized by Catling 2005, 70.
[534] Renfrew 1982a, 43.
[535] Renfrew *et al.* 2007, 486; Renfrew 1982a, 43; Renfrew 1978, 11-12.
[536] Sparkes 1982, 45; Wagstaff and Cherry 1982, 140 discussed survey data from Melos survey of 1976 and the paucity of finds post abandonment of Phylakopi; Catling 2005 discussed 1989 survey that largely corroborated the lack of Protogeometric, and Early Geometric period finds.

settlement was established on the northeastern side of the Bay of Melos.[537] Ancient Melos continued to be occupied into early Byzantine times.

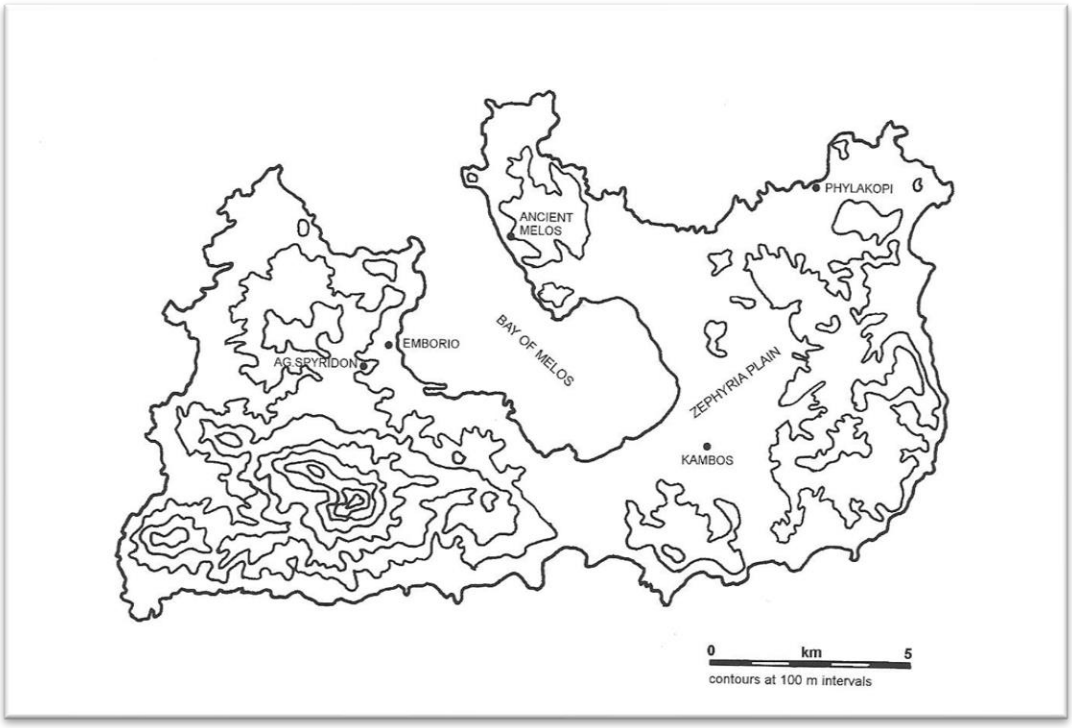


***Figure 4.28 Map of Melos. From Catling 2005, 72.***

## *Phylakopi*

Phylakopi sits on the northern shore of east Melos. The site abuts the sea and is relatively flat on its eastern side. It is not defensively sited.[538] A port area to the northeast of the site has been identified but is unpublished. Most likely some of the northern part of the site has been lost to rising sea levels. The 1976 survey identified many Early Bronze Age rural sites that were abandoned towards the end

[537] Sparkes 1982, 45-6; Wagstaff and Cherry 1982, 142; Craik 1980, 26ff, 30ff, 52.
[538] Barber 2005, 3.

of the Early Cycladic period. *Circa* 2100 the population became concentrated at Phylakopi.[539] The Late Bronze Age had two distinct phases at Phylakopi; Minoan and Mycenaean.[540]

The Minoan period corresponds to Late Cycladic I, *c.* 1600-1380 (Late Minoan 1A and 1B). This is best documented by numerous Minoan pottery imports, a Linear A tablet found well stratified in a Late Cycladic I level, and the remains of frescoes found inside a room titled the Mansion by excavators.[541] Tephra from the eruption of Thera was found within Late Cycladic I period strata in association with Late Minoan IA ceramic imports.[542] Occupation of Phylakopi apparently continued uninterrupted despite the eruption.

About 1380, ceramic imports from Crete stopped and were replaced by mainland Mycenaean imports.[543] Rich and varied Mycenaean terracottas, bronzes and a ceramic figure Renfrew named "Lady of Phylakopi" have been recovered. The Minoan Mansion building was destroyed and built over with a Mycenaean Megaron type of building. Two Mycenaean shrines were constructed near the fortification wall. The southern fortification wall was strengthened, and new walls were added.[544]

*Circa* 1120, there was a major destruction level evidenced by large masses of broken terracotta figurines.[545] Pottery imports were rare after this (Late Cycladic III). The East and West shrines were partially reoccupied for a brief period. *Circa*

[539] Renfrew and Brice 2007, 459.
[540] Renfrew 1982a, 39-43.
[541] See Barber 1987, 159-72 for pottery imports; Renfrew and Brice 2007, 456-8 for Linear A tablet discussion, 459 for frescoes; Renfrew 1982a, 39-41.
[542] Renfrew *et al.* 2007, 487.
[543] Renfrew 1982a, 41; Renfrew 1978, 7-10.
[544] *Ibid.*
[545] Renfrew 1982a, 43; Renfrew 1978, 10-12.

1090 the shrines all went out of use and Phylakopi was abandoned, never to be inhabited again.[546]

The 1976 survey revealed almost no ceramics from the Protogeometric periods on the island.[547] There was one Protogeometric sherd from Aghios Konstantinos. Scattered pottery at Aghios Spyridon may date to LHIIIC and possibly to the Protogeometric period.[548] Early and Middle Geometric finds were also rare.[549] The 1989 survey corroborated earlier survey results with respect to the lack of finds datable prior to *c.* 900.[550] The island seemed to have lost nearly all its population between the late 12th and 10th centuries.[551]

Repopulation appeared to have taken place *c*. 900-850 in what has been characterized a re-colonization similar to the pattern seen in the Early Bronze Age settlement of the island.[552] There was a marked increase in finds dated Late Geometric from Phaneromeni cemetery at Ancient Melos.[553] Items from this cemetery comprised a steady flow of Geometric ceramics to European museums from illegal digs.[554]

The physical resettlement evidence revealed by archaeology differs from the ancient literary tradition. Thucydides (5.112) recorded that in response to the Athenian threats of 416, the Melians refused to give up their freedom in a city they

[546] Renfrew 1978, 10-12.
[547] Wagstaff and Cherry 1982, 143.
[548] Catling 2005; Cherry 1982b, 306 calls LHIIIC material equivocal, two sherds of PG date were found.
[549] Cherry 1982b, Appendix A.
[550] Catling 2005, 70-1.
[551] Barber 2005, 3; Sparkes 1982, 45; Wagstaff and Cherry 1982, 140-42.
[552] Wagstaff and Cherry 1982, 142; Malkin 2011, 78 interpreted the re-settlement of Melos as part of a Spartan colonization push that included Thera.
[553] Wagstaff and Cherry 1982, 142; Coldstream 2003, 210.
[554] Catling 2005, 70; Wagstaff and Cherry 1982, 142.

claimed to have inhabited for 700 years. That would place the Melian's arrival around 1100 at the time Phylakopi was abandoned.

Herodotus (8.48) noted that the Melians took their lineage from Lacedaemon and Thucydides (5.84) recorded that the Melians were a colony of Sparta. There are two pieces of physical evidence to corroborate the Dorian claim; an inscription and a hoard of Melian coins. There is only one extant Archaic inscription from Melos, a dedication on a fluted marble column shaft of unknown provenance, *IG* xii.3.1077, 1081. The script used Dorian characters similar to Cretan (see Fig. 2.1).[555] The coin hoard was in a clay pot of unrecorded type, containing about 100 coins discovered by local children early in the 20th century in Ancient Melos. Eighty-four coins survive from the hoard. Fifty of the coins weigh between 13.75 – 14.34 grams, which was the denomination of an Eastern Greek *stater* and not the more prevalent Athenian *tetradrachm* of 17.20 grams.[556] Melos was the only Aegean island to use this standard. Several of the coins are struck with the name of Melos on them, some with the five-legged Doric M and several with the four-legged Attic M.[557] The physical evidence does seem to corroborate that the Geometric period settlers were Dorians from Laconia and were probably ethnically different from the Bronze Age inhabitants.[558]

## *Ancient Melos (Trypti)*

The newcomers to Melos founded a city at a location different from Phylakopi. Ancient Melos was built on a saddle between two peaks; the seaward end rises to Prophitis Elias at 126 m and to Pereanti (Pyrgaki) at 198 m to the north (see Fig.

[555] Jeffrey 1990, 320-1.
[556] Sparkes 1982, 47; Kraay 1964, 1-2, 12, 18.
[557] Jeffrey 1990, 321-2; Kraay 1964, plates 1, 2, 3.
[558] Sparkes 1982, 45-6.

4.29).[559] The land west of the site slopes sharply while the eastern slope is more gradual. It was a defensive location yet was proximate to its harbour of Klima. The agora is 100 m above sea level.[560] The site was ringed by fortification walls about 1,800 m in length of which about 750 m are extant. The date of the earliest fortification wall is undetermined. Outside the walls to the northeast was a necropolis. Ancient Melos became the controlling *polis* of the island.[561] Klima had traces of Classical and Roman harbour moles and foundations of submerged stoas. Rescue excavations in 1998-1999 and 2001-2002 dealt primarily with Hellenistic and Roman buildings.[562] Most ceramics were early Byzantine, but some Archaic sherds were found.

The site of Ancient Melos has been compromised by the construction of agricultural terraces and stone recycling for secondary building purposes.[563] The stratification is disturbed. Archaic period finds are few; just one Doric capital with sixteen flutes and one *kouros* dated *c.* 550.[564] The richest finds have been Late Geometric pedestal burial kraters from Phaneromeni.[565]

Ancient Melos seems similarly sited to Palaeopolis on Andros and Vrykastro on Kythnos in that it abuts a good harbour, is westward facing, and rises to an acropolis.[566]

[559] Barber 2005, 2-6; Cherry and Sparkes 1982, 53-57.
[560] Barber 2005, 6, Fig. 2.
[561] Sparkes 1982, 45.
[562] *AR ID* 1990, 543; *AR ID* 2002, 3240.
[563] Cherry and Sparkes 1982, 53; Coldstream 2003, 210.
[564] Cherry and Sparkes 1982, 53, Fig. 20.3.
[565] Boardman 2001, fig. 36; Coldstream 2003, 89, 209-10, Fig. 67.
[566] Barber 2005, 3-6.

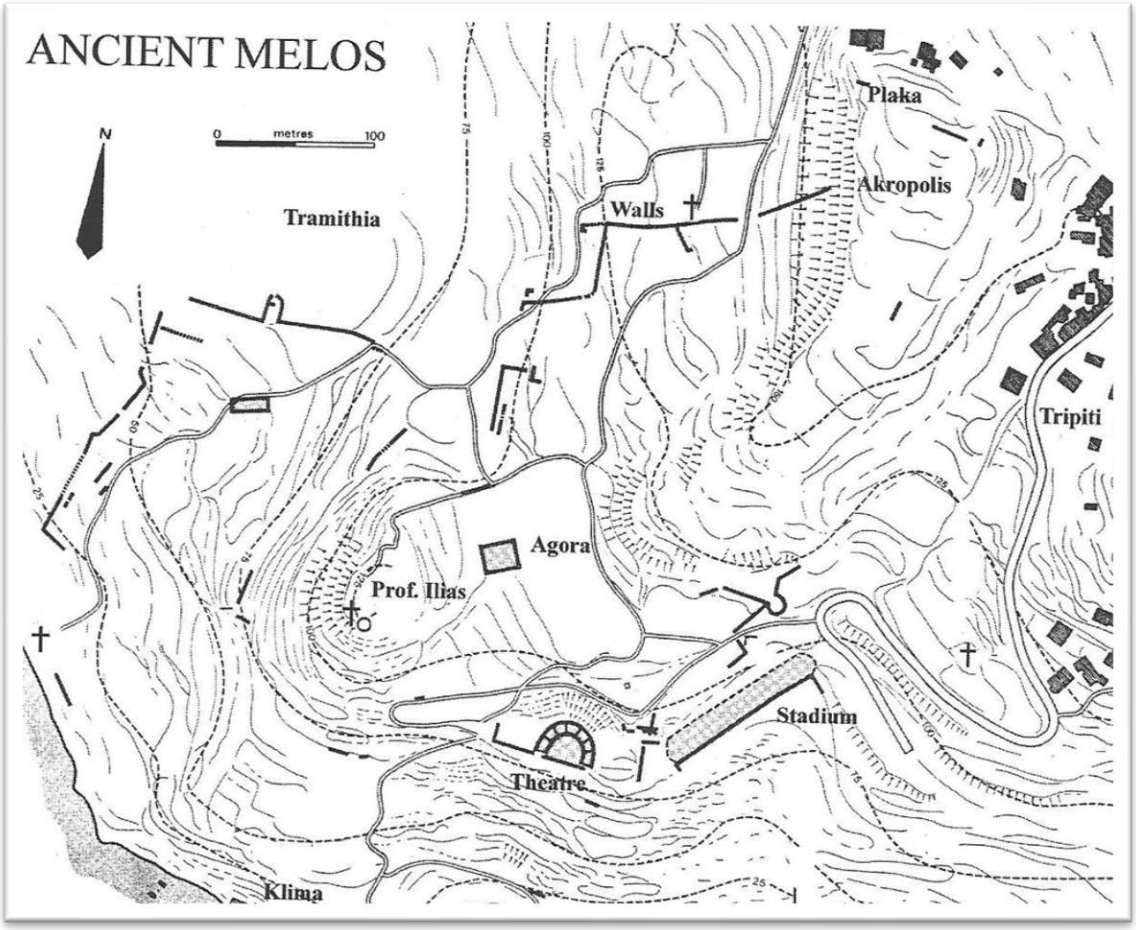


***Figure 4.29 City of Ancient Melos. From Barber 2005, 4.***

## *Other Archaic Period Settlements on Melos*

In the 1976 survey, 39 Archaic sites were identified.[567] There was a gradual move towards denser habitation as only 28 Classical and 15 Hellenistic period sites have been identified. The 1989 survey identified a greater rural population on the island from late 7th to end of 6th century than the 1976 survey did, including finding a

[567] Wagstaff and Cherry 1982, 143-4; Cherry 1982a, Table 2.1.

previously unknown settlement at Emborio.[568] This survey noted the move to greater nucleation into a single *polis* at Ancient Melos as almost all rural settlements were abandoned *c.* 500.

Emborio was a small settlement of 100-200 people on top of a small ridge at the seaward end of a deep valley. The site had a reasonably protected harbour and the excavators suspect that there was some export of mineral products from the site as two large settling bins have been recovered. There was a significant concentration of imported ceramic material including transport amphorae.[569]

Kambos was located inland on the eastern portion of the island. This site was abandoned at the end of the 6th century.[570] Kambos has been interpreted by Catling as potentially a pottery production centre as there are significant clay beds in the area. Remains of kilns and settling tanks were found. The clay near Kambos was distinctive with a yellowish-brown colour, high iron content, noticeable black volcanic and large soft white tuffa inclusions.[571]

There are some 8th century remains in what is now the half-abandoned modern village of Zephira, also known as Palaeochora, which was the medieval capital of Melos up to 1767.[572] Near to salt marshes on the seaward side, it seems to have been an unhealthy place with bouts of plague and perhaps odour from sulphur vents.

The Archaic and Early Classical period of Melos came to a sad end with the massacre of the male Melian population and reduction of the women and children to slavery by the Athenians in 416/415. The story as related by Thucydides (5.84-

[568] Catling 2005, 71-4.
[569] Catling 2005, 71-4.
[570] Catling 2005, 74-7.
[571] Catling 2005, 75-6.
[572] McGilchrist 2010, 237; Barber 2005, 5.

116) is chilling. Xenophon (*Hell.* 2.2.3) recorded that the Athenians were concerned the Spartans would do the same to them after Aegospotami.

#### 4.2.6.3 Economy

The Melians had a robust trade throughout antiquity of its many and varied mineral resources.[573] Other than the obsidian which can be chemically identified, these mineral exports did not leave a traceable trail for the most part. Alum (a hydrated sulphate of aluminium), used in dyeing and tanning, Kaolin (a hydrous silicate of aluminium), used for whitening and thickening cloth as well as in ceramics and for cosmetics, and abrasives such as pumice were mined and exported from Melos throughout antiquity.[574] With their distinctive fabric, the ceramic wares from Kambos are traceable.[575] Ceramic exports however are not plentiful and are found only on the near islands of Kimolos and Siphnos and at Tocra in North Africa. This fits with the aforementioned trade route moving south from the Saronic Gulf to Melos, western Crete and on to North Africa.

According to Plutarch (*De mul. vir.* 7.246.d, 247a) and Polyaenus (*Strategemata* 8.64), the Melians founded a colony at Kryassos in Caria near the base of the Knidian peninsula.[576] Sparkes suggested that this association with the Carian coast may have been a factor in Melian adoption of the Milesian stater standard.[577] No other Melian colonies are attested.

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[573] Shelford 1982, 74-81.
[574] Alum and Kaolin (Melian Earth) are mentioned by Pliny the Elder, *Naturalis Historia,* 33.65, 88, 94-8; 34.106, 116; 35. 183-8; 36. 154-6; Dioscorides *De Material Medica,* 5.114, 171-9; Theophrastus *de Lapidibus*, 9.62. McGilchrist 2010, 233-6 and Renfrew 1982b, 275-8 both give a concise description of the various minerals that were mined and their uses; see also Pittinger 1975.
[575] Catling 2005, 74, 76. Catling suggested speculatively that the Persian conquest of Egypt and Cyrenaica in 525 may have closed the North African market to ceramic wares from Kambos which lead in part to the town's abandonment a generation later.
[576] Malkin 1994, 76.
[577] Sparkes 1982, 47.

#### 4.2.6.4 Summary

While the evidence suggests a discontinuity in habitation occurred between 1100-900; in all other periods, the inhabitants of Melos seem to have exploited the island's mineral resources. The economic plan of exploiting mineral resources and participating in trade networks by the Dorian Greek speakers on Iron Age Melos seems no different from the Ionian speaking Greeks on the other islands in the Western String. Trade goods suggest a north/south pattern of contact across periods rather than the change to an east/west pattern in the Iron Age as seen in the other Cycladic islands. This is probably because Melos is too far south of the route from the Saronic gulf to the east to catch a piece of that trade.

### 4.2.7 Kimolos

Kimolos is separated from Melos by a one km channel and from Polygaios to the east by less than two km (see Fig. 4.1). The island has an area of 36 km² with a high point of 365 m. Like Melos, Kimolos had exploitable mineral assets. Strabo described Kimolos as the source of Kimolian earth (Kaolin).[578] Kaolin quarries are still in operation on the northern tip of the island. Polygaios lacks drinking water and was probably not inhabited.[579]

The ancient *polis* of Kimolos was situated on the west coast at the Bays of Dekas and Mavrospilia, one bay split by a small rock formation. Offshore is the islet of Daskaleió (see Fig. 4.30). The area is referred to as Ellenika. The ancient city is

[578] Strabo *Geog.* 10.5.1 "ἐγγὺς δὲ τούτων Κίμωλος, ὅθεν ἡ γῆ ἡ Κιμωλία" Near these is Kimolos from whence comes the Kimolian earth (LOEB trans.); LOEB 211, 161, n5 described Kimolian earth as a hydrous silicate of aluminum, now called kimolite. More commonly referred to as kaolin, fuller's earth, a clay used in antiquity as a whitening agent in pottery and textiles. It is also used in cosmetics. For additional ancient authority see Dioscorides *de Material Medica* 5.175; Pliny *NH*, 35. 195-6; Theophrastus *de Lapidibus*, 9.62.

[579] McGilchrist 2010(19), 182; Reger 1997, n37 see *IG* XII 3.1259 on friction between Melos and Kimolos over Polygaios.

largely underwater, visible between the end of the promontory and the islet. Some remains exist on the unexcavated islet and in the ancient cemeteries on the main island shore.[580] A Mycenaean cemetery and 13th century pottery indicate Late Bronze Age habitation in the area.[581] Twenty cremation burials dated to 8th century yielded 200 mostly Late Geometric vases (see Fig. 4.31).[582] Origin of the vases is uncertain with several Cycladic provenances proposed as well as an Argive-Corinthian globular type of pyxis.[583] A grave stele produced out of volcanic stone dated to 7th century was also found. The cemeteries continued in use through the Classical and Hellenistic periods.[584]

On the island's high point are traces of Archaic period and Mediaeval fortification walls.[585] There is no Classical period attestation of Kimolos as a *polis* but the Kimolians were members of the Delian League. Like Melos, whether they paid their assessment is uncertain. Kimolos was not mentioned in the list of 441/440 but in the 425/424 assessment the *phoros* was 1,000 dr.[586]

[580] Reger 2004, 752; Mustakas 1954/1955; Cook and Boardman 1953, 165.
[581] Pantou and Ditsa 2011; Mustakas 1954/5, 154; Cook and Boardman 1953, Fig. 14a.
[582] Coldstream 2003, 91; Cook and Boardman 1953, 165, Fig. 14b.
[583] Mustakas 1954/5, 157; see Coldstream 2003, 90, Fig. 26.a on pyxis.
[584] McGilchrist 2010(19), 184.
[585] McGilchrist 2010(19), 188.
[586] Reger 2004, 752.

***Figure 4.30 Ellinika on Kimolos between rocky outcrop and island of Daskaleio. Photo by Alex Mertzanis (Flickr - all rights reserved)***

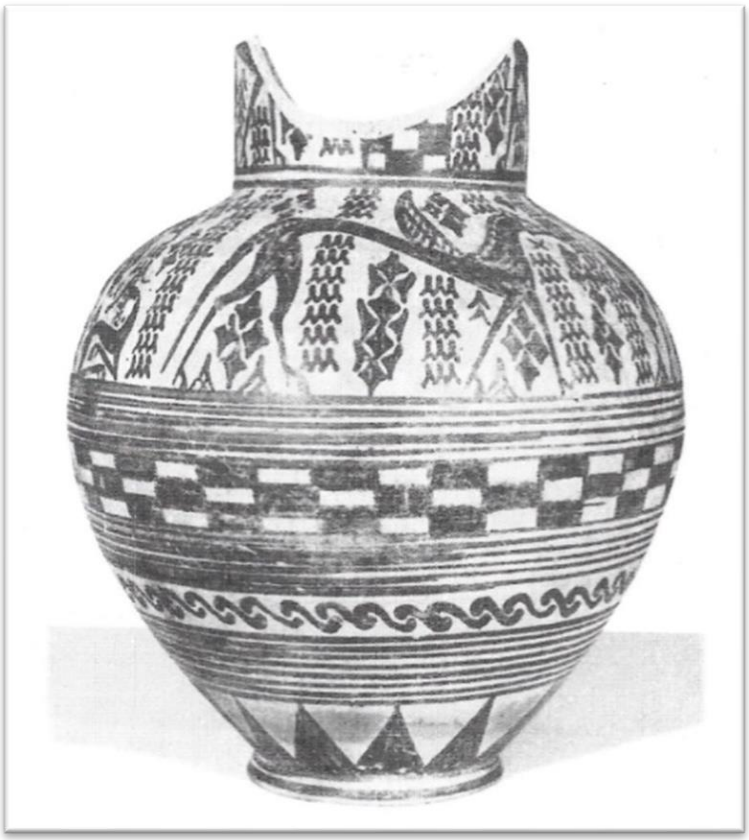


***Figure 4.31 From Geometric burial at Ellinika. Mustakas 1954/5, Fig. 56.3.4.3.***

## 4.3 Central Islands

### 4.3.1 Introduction


***Figure 4.32 Central Cyclades; Paros, Naxos, Lesser Cyclades and Donoussa. From Google Earth.***

The central islands of Naxos, Paros, Antiparos, Despotiko, Donoussa, and the Lesser Cyclades form a distinct group based on their geomorphology. The islands are the visible above water high-points of a common geological massif (see Fig. 4.32).[587] The geology is primarily metamorphic rock consisting of schists and marble.[588]

Naxos and Paros dominated the Cyclades in several aspects. Naxos is the largest in total area, height, and arable land area. Paros, with its associated mini-archipelago, is third in total area, third in height and second in arable land area (see Table 1). In the Archaic period the economic output of the central Cyclades

[587] Lambeck 2014, Fig 12; Cunliffe 2008, 63-4, 67, Fig. 3.2.
[588] Bruno, Lazzarini, Soligo, Turi, and Varti-Matarangas 2010, 101-2.

was also dominant. In the Delian League assessment of 425/424, Paros was charged the most of any island, 30 talents, double the 15 talents the second equals Andros, Melos, and Naxos were each assessed (see Table 1).[589] Paros and Naxos together were assessed 45 talents, while the rest of the islands combined were assessed 64 talents (not including Melos). Ancient authors mentioned conflict between Paros and Naxos.[590] Art Historians have described zones of Parian and Naxian influence in Geometric pottery.[591]

The location of the central islands forced maritime navigators to decide to go around the north or around the south of the islands (see Fig. 3.17). As discussed in Chapter 3, the ramifications of this simple decision had implications for technological and cultural diffusion.

## 4.3.2 Paros

### 4.3.2.1 Introduction

Paros is a mini-archipelago consisting of four larger islands and numerous islets. Geologically, the islands were probably a single unit until the 2nd millennium when a combination of settling and rising sea levels caused separation.[592] Modern analysis of sea levels suggests that Antiparos and Despotiko were connected until the Classical period.[593] When separation of Paros from Antiparos occurred is less

[589] As discussed below, Melos's assessment was probably punitive and never paid. As an indicator of the island's economic output it must be considered with caution.
[590] Archilochos was killed by the Naxian Corax (see LOEB 259 *Greek Iambic Poetry,* 24, 32, 38, 40; Herodotus (5.31) and Diodorus Siculus (7.1) both wrote of the conflict between Paros and Naxos, indicating that *c.* 530, Paros briefly came under Naxian control; see Kourayos 2018c, 280-1; Kourayos and Daifa 2017, 316-17; Kourayos, Angliker, Daifa, and Tully 2018, 147-8 suggests competition/disputes over Delos.
[591] Koutsoumpou 2017, 165; Boardman 1998, 110-12; Coldstream 2003, 213-18.
[592] Lambeck 2014, Fig 12.
[593] Draganitis 2009.

certain.[594] The islet of Saliagos in the channel between Paros and Antiparos likely was not a separate island at the time of Neolithic settlement in the 5th millennium.[595] The total area of the island group is about 260 km². Paros is the largest with an area of 196 km², Antiparos 38 km², Despotiko 8 km², and Strongylo about 3 km².[596] The high point of Paros is a central peak of 724 m. The northern bay of Naoussa and the western bay at Paroikia are excellent all-weather anchorages as is the Bay of Aghios Georgios between Despotiko and Antiparos (see Figs 4.32, 4.43). The island's littoral plain is relatively flat compared to most other Cycladic islands with 61.0 km² of farming area, second most in the Cyclades after Naxos. The northern plain is well-watered with a seasonal river in the western portion flowing into the Bay of Naoussa at the foot of Koukounaries.[597] The subsoil of Paros is composed primarily of metamorphic rocks consisting primarily of schists and marble. Some of the marble deposits were of excellent quality stone noted for its fine grain, which was exploited from the mid-7th century (see Fig. 4.52).[598] Metal-bearing ore deposits are not found on the island. Fragments from the writings of the Parian Archaic poet Archilochus survive, a unique written source regarding Cycladic life in the Late Geometric/Early Archaic period.[599]

Paros and its associated islands have received considerable archaeological attention. In the early 20th century, Rubensohn excavated in Paroikia and at the Sanctuary of the Delian Apollo. The Greek Ephorate has done work in northern Paros at Koukounaries and other sites including survey work under the direction of Schilardi in the 1970s and 1980s.[600] This work is published in a variety of

[594] Kourayos 2018a, 13; Katsarou and Schilardi 2004, 23.
[595] Evans and Renfrew 1968.
[596] Dawson 2014, Table 6.4; McGilchrist 2010(5).
[597] Kourayos 2015, 11.
[598] Bruno, Lazzarini, Soligo, Turi, and Varti-Matarangas 2010, 101-2.
[599] See Katsonopoulou, D., Petropoulos, J. and S. Katsarou (eds) 2008. *Archilochos and his Age* (Paros II), Athens.
[600] Bruno 2010.

publications but not synthetically. Zafeiropoulou excavated the cemetery at Vitzi and other sites in Paroikia, her work is slowly being published by others. Kourayos has been involved in rescue digs in Paroikia as well as leading the work at Despotiko which has a good record of publication.

#### 4.3.2.2 History

Three geographic areas of the Parian archipelago will be discussed below: Northern Paros, Despotiko, and Paroikia (In antiquity, Paros was the name of the *polis* and the island, here Paroikia is used for the settlement for clarity).

##### *Northern Paros*

Two Bronze Age sites have been excavated on Paros. Koukounaries, a settlement on the north end of the island, was excavated by Schilardi in the 1970s and 80s, and Paroikia early in the 20th century by Rubensohn. The site at Koukounaries is open for exploration and the material from the excavations are in the Paros Archaeological Museum. The excavations of the Bronze Age site of Paroikia have been paved over by the construction of a public plateia on the Kastro summit. The material finds from the excavation are scattered; some in Germany, some were lost, and some in the Paros Archaeological Museum.[601]

Koukounaries is a 75 m bare rock hill at the southwest corner of the Bay of Naoussa. A Neolithic period settlement dated from Late Neolithic II to Early Cycladic II was established.[602] The bedrock top of the hill appears to have been levelled and a large area of 26.0 m by 33.0 m created on which a significant Late

[601] Overbeck 1989 reviewed the Paroikia material available in the Paros Archaeological Museum. He found the numbering system on the Museum material did not match with Rubensohn's published catalog. Overbeck noted that the biscuit had a noticeable mauve or dark rose tinge. Extant surface sherds seen by the author at Koukounaries have a similar biscuit color.
[602] Katsarou and Schilardi 2004, 25-6, 30-7.

Bronze Age settlement was centred (see Fig. 4.37).[603] The settlement consisted of a series of interconnected buildings that Schilardi termed a Mycenaean mansion (see Fig. 4.34, the light coloured walls are the Late Bronze Age levels). The buildings were protected by a Cyclopean wall, 1.66 m thick built of stone quarried from Koukounaries.[604] The Late Bronze Age strata shows a significant destruction level marked by thick ash, bronze arrowheads and spearheads, one 40 cm long. A female skeleton with a head wound made by a sharp object was found as well as the bodies of several children and at least one male about 35 years old (see Fig. 4.33).[605] Carbonized animal remains in the same area consisted of goats, small horses, and cattle.[606] Pottery suggests a Late Helladic IIIC timeframe for the destruction.[607] The Late Bronze Age settlement at Paroikia did not have evidence of a destruction level.[608] Generally speaking, the end of the Bronze Age was not violent in the Cyclades, Koukounaries was the exception.[609]

[603] Schilardi 1984, 187.
[604] Schilardi 1984, 187.
[605] Schilardi 1984, 187-90.
[606] Schilardi 1984, 200-1.
[607] Schilardi 1984, 195; Koehl 1984 has published a pottery catalog of this material.
[608] Rubensohn 1917.
[609] Vlachopoulos 2008a, 231; 2008b, 490-1 reached the same conclusion.

***Figure 4.33 Koukounaries destruction layer with broken pots and animal bones. From Schilardi 2016, Fig 63.***

The site of Koukounaries continued to be inhabited post-destruction on the top of the hill, albeit lightly, as evidenced by a few architectural features built over the destroyed Mycenaean levels (see Fig. 4.34).[610] Pottery from this subsequent stratum were few and generally coarser in both fabric and design than the pre-destruction pottery. Late Helladic IIIC pottery was limited to a single lekythos from square E3 and a few dull-black skyphoid sherds.[611] Koukounaries may have been deserted in the early Protogeometric period before re-habitation in the Later Protogeometric period.[612]

[610] Schilardi 1984, 203-4.
[611] Schilardi 2016, Figs 75, 76.
[612] Schilardi 1984, 204.

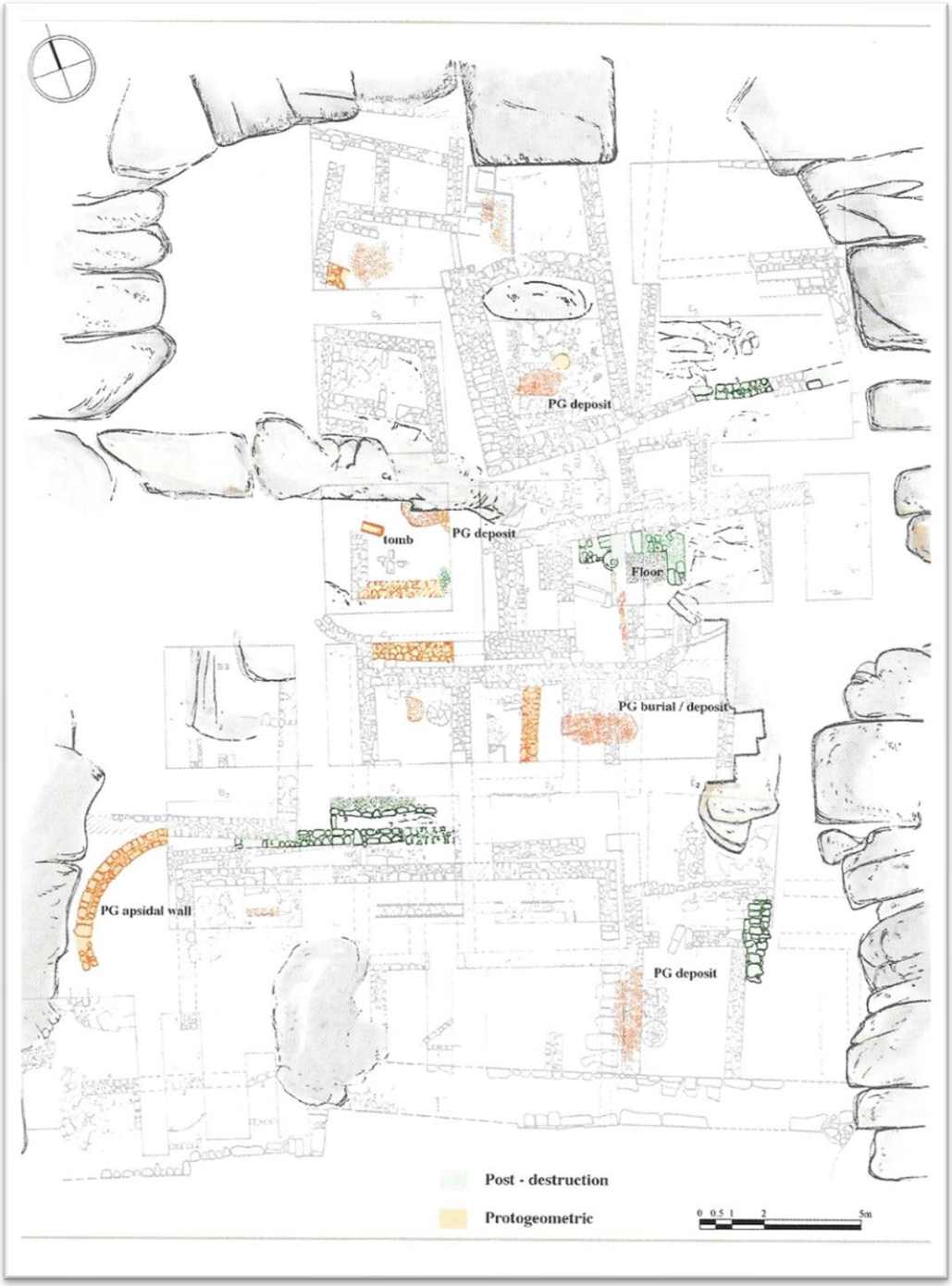



***Figure 4.34 Koukounaries Sub-Mycenaean and Protogeometric Levels. From Schilardi 2016, Fig. 72.***

The upper plateau of Koukounaries showed evidence of occupation in the early 10th century where a settlement remained until late 8th century.[613] Rectangular walls from house structures and a curved apsidal wall on the southwestern area of the citadel are visible.[614] Pottery included Athenian imports (cups and a skyphos with a conical foot) as well as locally produced ware including a decorated krater (see Fig. 4.35) and under the floor of Geometric period house E, an assemblage of coarse cookware.[615]

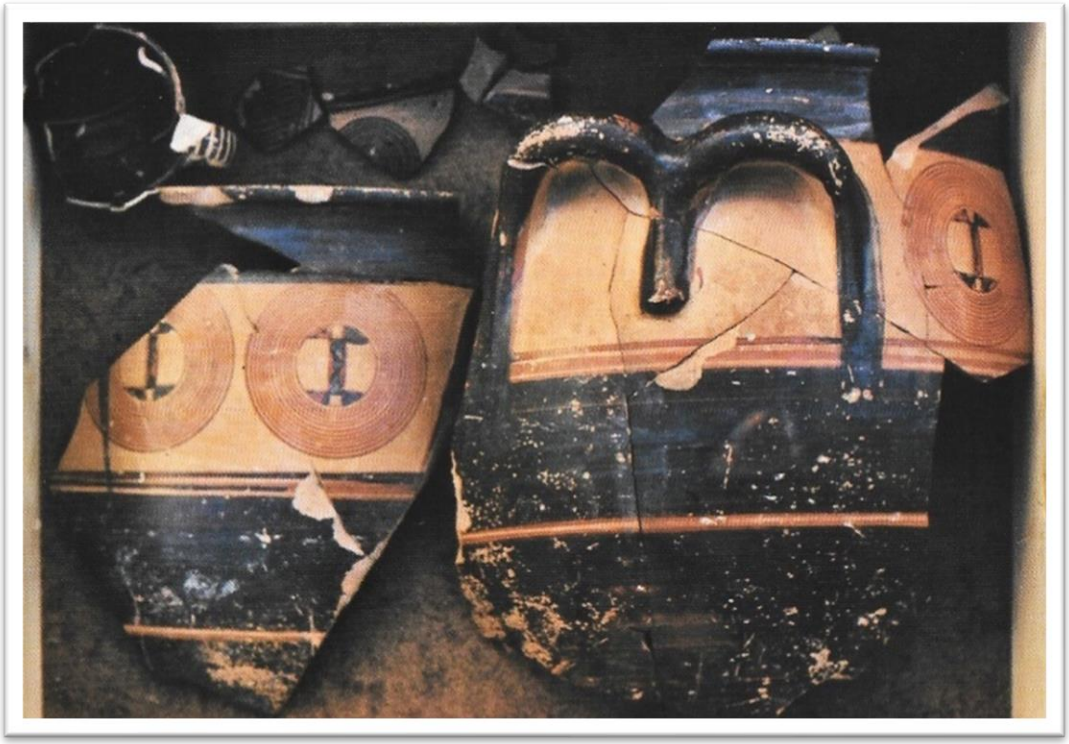


***Figure 4.35 Fragments of Parian Protogeometric krater and imported Athenian krateriskoi, Trench D3, Koukounaries. From Schilardi 2016, Fig. 80.***

[613] Schilardi is inconsistent on whether Koukounaries was abandoned for a period or not, at times attesting that it was and other times that habitation was continuous, see Gounaris 2005, n118. There is a gap in the evidence supporting continuous habitation after the rump building phase over the LHIIIC destruction level.
[614] Schilardi 2016, Fig. 79; 1983, 175.
[615] Schilardi 2016, 54, Fig. 85; 1983, 175.

At the end of the 8th century, the settlement loci moved from the citadel to a large bench area about 50 m lower to the southeast (termed 'middle plateau') and to a yet lower plateau to the east ('lower plateau') (see Fig. 4.37). Pottery from the Early and Middle Geometric periods are few, whereas Late Geometric finds were plentiful and included open shapes with bird decorations done in dark wash on a light buff background, and coarse cookware.[616] An intriguing fragment from a pithos or amphora was found on the citadel that Schilardi considered 'Orientalizing' in its design (see Fig. 4.36). The shape of the head of the figure on the left seems of the Daedalic type as seen at Despotiko (so-called Pipina), in Melian vases from Vitzi cemetery, and Delos.[617]

[616] Schilardi 2016, Figs 86, 88, 90, 92.
[617] Alexandridou 2018, 89-92, Figs 5, 8, 9, 10.

***Figure 4.36 'Orientalizing' fragment from northeast corner of upper plateau Late Geometric period 'megaron', dated second quarter of 7th c. From Schilardi 2016, Fig. 94.***

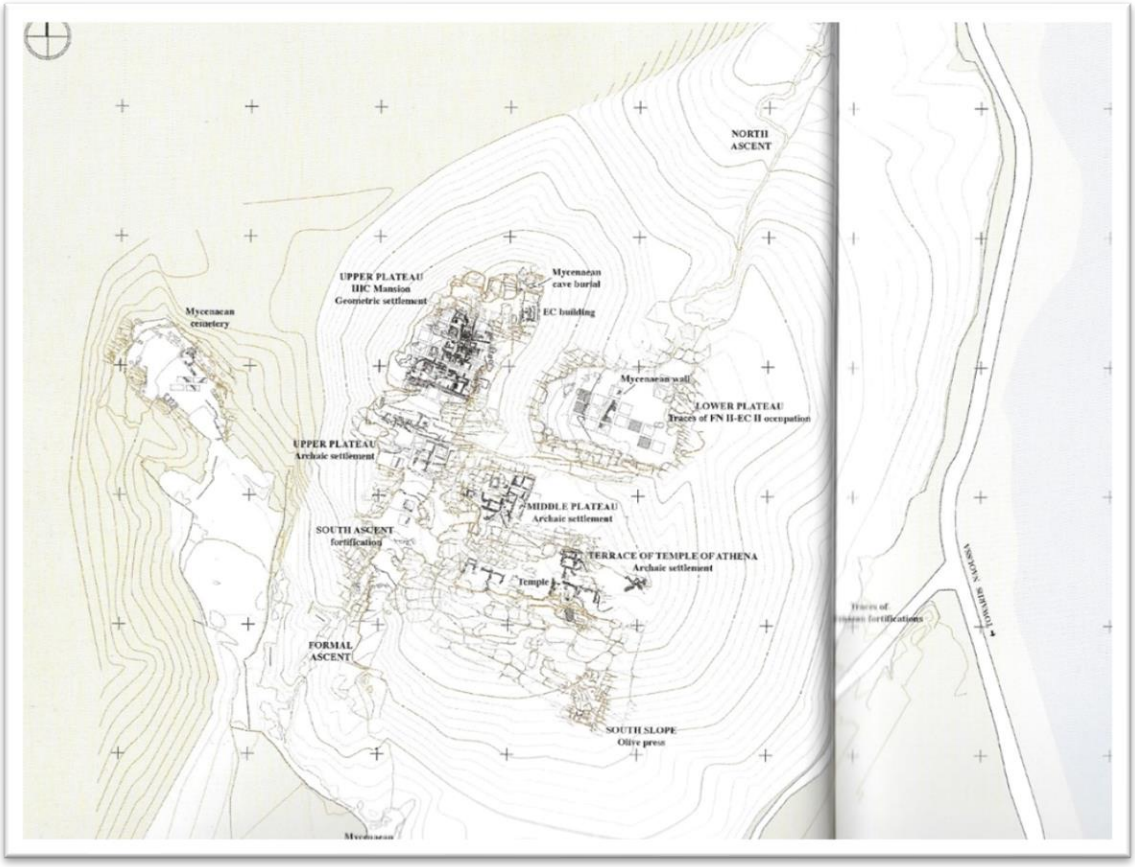



***Figure 4.37 Site Plan of Koukounaries showing Upper, Middle, and Lower Plateaus. From Schilardi 2016, 12.***

The settlement area grew with Late Geometric buildings covering some of the Late Bronze Age buildings on the citadel as well as new construction evident on the lower areas.[618] A large rectangular building 13.70 m long constructed of local schist was built on the west end, south side of the middle plateau (see Fig. 4.38).[619] Another large structure on the north of the terrace measured 6.60 m by 5.20 m.. An extensive ash layer covered the floor and has been interpreted as a domestic hearth of a house.[620] Schilardi labelled this structure the Gathering Hall (see Fig.

[618] Schilardi 1983, 175-8.
[619] Schilardi 1983, 177-8, the south wall does not survive making the width is indeterminate.
[620] Schilardi 1983, 178.

4.38) and suggested that by the end of the 8th century communal feasting activities were held in it.[621] To the south of the Gathering Hall, are foundations of a simple *oikos*-shaped rectangular building.[622] The building was 9.50 m by 6.40 m, consisting of two rooms, built of local schist blocks on the lower courses and mud-bricks above, 0.50 m thick. A large threshold 1.42 m wide opened to the east.[623] Inside the structure, a low schist bench ran along the east stub-wall and the long north wall. Late Geometric pottery from trenches dug against the foundations of the cella, suggest *c.* 700 as the foundation date for the cult building.[624] Proximate to the threshold was a hypaethral altar, 1.58 m by 0.80 m, which upon deep excavation, revealed ash and bone layers dated to Late Bronze Age (see Fig. 4.39).[625] Immediately to the south, the terrace dropped off about ten m.. From this lower level was found a deposit of cult detritus including worked stone, votive items, and pottery. Several pot sherds inscribed AΘHN-AIHΣ as well as a terracotta plaque depicting Athena, suggest the building was dedicated to Athena.[626] Cult activity honouring Athena continued at Koukounaries into the Hellenistic period.[627]

[621] Schilardi 2016, 81, Fig. 133.
[622] Schilardi 2017.
[623] Schilardi 2002, 231; 1988, 44 Schilardi titled this phase a temple. In this paper the term cult building has been used until a marble structure with columns was built which is then referred to as a temple - suggesting the temple is an architectural development.
[624] Schilardi 1988, 45.
[625] Gounaris 2005, 41, Fig. 13.
[626] Schilardi 2016, Fig. 112 inscribed pot sherd, Figs 118-132 cult deposits; Schilardi 1988, 46-7, Fig. 4 terracotta relief of Athena dated 5th c..
[627] Schilardi 2016, 77; 1988, 47, n66.

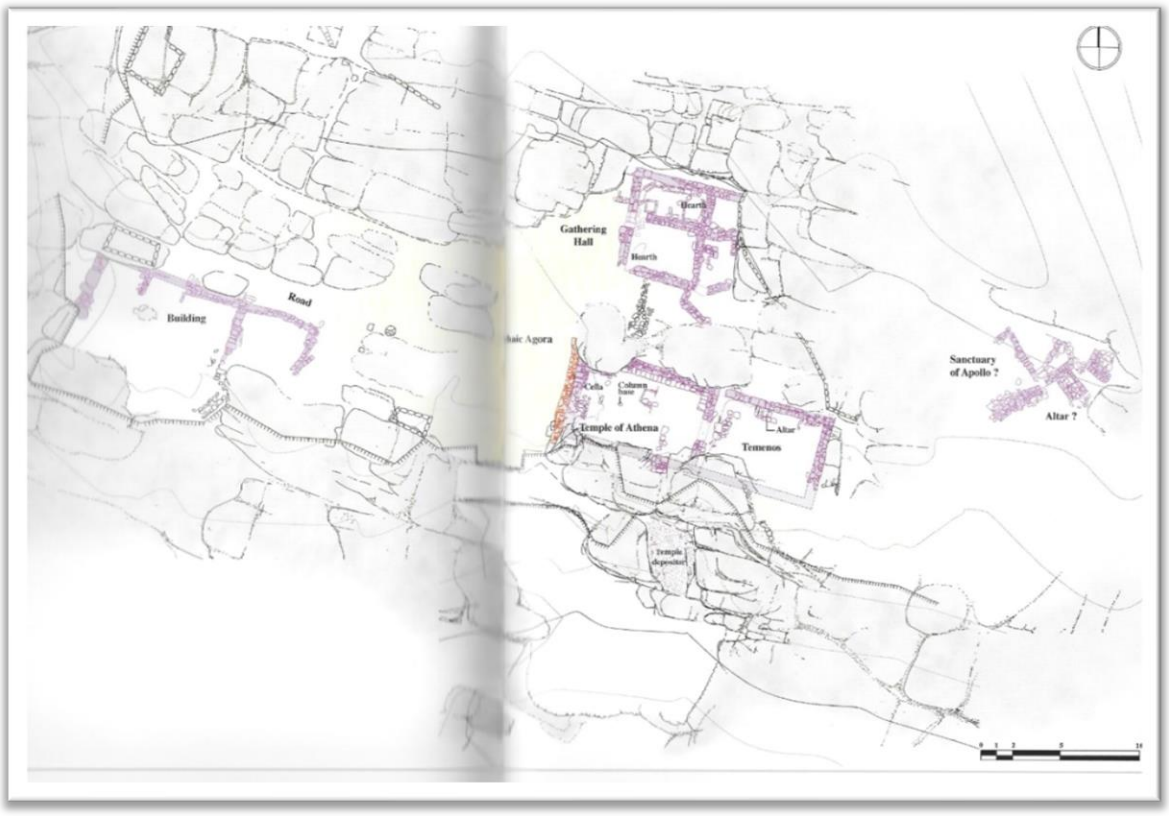



***Figure 4.38 Middle Plateau with Temple. From Schilardi 2016, Fig. 109.***

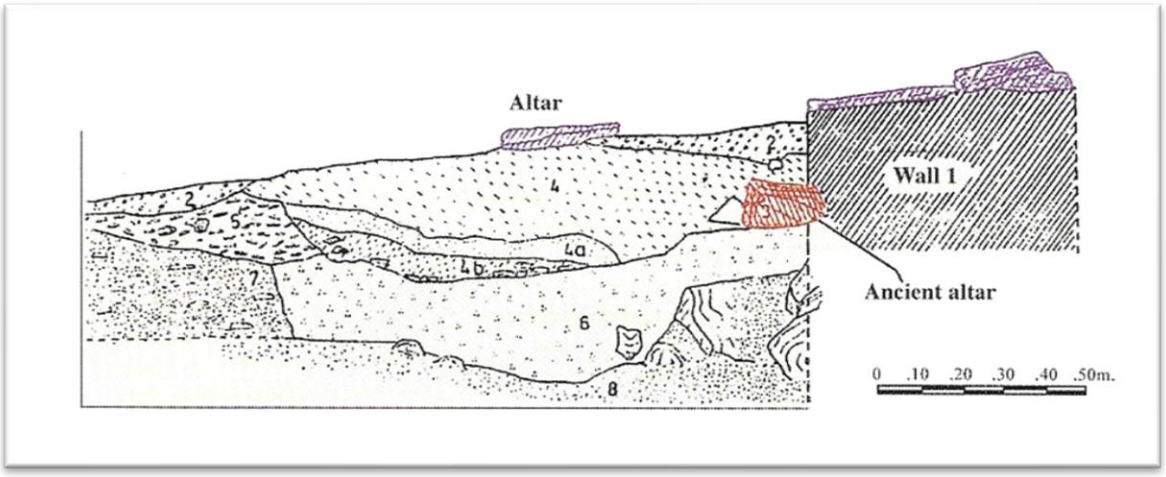



***Figure 4.39 Hypaethral Altar cross-section. From Schilardi 2016, Fig. 115.***

The northern plain of Paros was well populated in the Late Geometric Period. There are about a dozen sites; among them Kargadoura, Filizi, Sarakinika, Livadera, Ag. Ioannis Detis, and Oikonomos (see Figs 4.40, 4.41, 4.42) many of which were identified in survey work conducted in the 1970s by the Greek Archaeological Service.[628] Oikonomos was the largest site (after Koukounaries) with remains of a circuit wall (thirteen m diameter, wall thickness 1.40 m), an apsidal building (oriented east/west, 15 m by 6.7 m), and an east/west street pattern within the walls (see Fig. 4.41).[629] The northern plain of Paros is arguably the best agricultural land on the island, requiring only minor terracing on the western side and with several seasonal streams flowing into the Bay of Naoussa (see Fig. 4.40). Yet these sites were apparently all abandoned in the first half of the 7th century. The abandonment appears to have been peaceful as there were no precious finds left behind, nor were there traces of destruction levels.[630] The abandonment coincided with the richest period of Late Geometric pottery found on Paros, including 'Wheel Group' designs (see Fig. 4.47).[631]

[628] Kourayos 2015, 55-7; Gounaris 2005, 41, Fig. 14; Schilardi 2002, 236; 1983, 174 refers to a "significant number of settlements", 182; 1975, 83, n1.
[629] Schilardi 2002, 232-3, 236; 1983, 180-2, Fig. 12. Today, the maqui has grown considerably from when the site plan was drawn in 1977. Walls are obscured by thick foliage; surface pottery remains are considerable. Detis site is more typical of other Late Geometric sites in Northern Paros with a few walls and surface coarseware.
[630] Schilardi 2002, 232; 1983, 182.
[631] Schilardi 1983, 182; see Sheedy 1990; 1985 on Parian pottery.


***Figure 4.40 Late Geometric and Archaic Period Sites in Northern Paros. From Google Earth.***

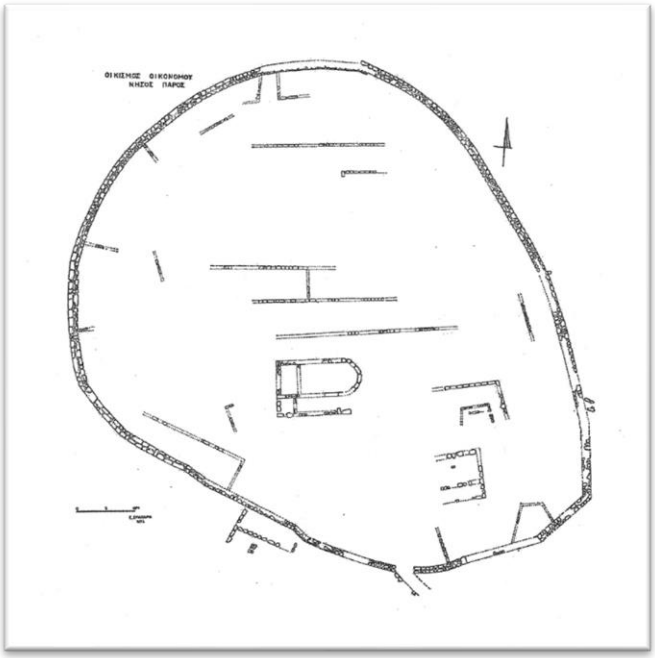


***Figure 4.41 Plan of Oikonomos. From Gounaris 2005, Fig. 14.***

***Figure 4.42 Top: Wall from Detis; Bottom: Sherd from Detis.***

Schilardi advanced two theories for the cause of the abandonment of the northern settlements; one, drought which he theorized may have dried up a spring northeast of Koukounaries. As evidence of this he cited a fragment from Archilochos that drought may have occurred during Archilochos' lifetime (several generations post abandonment) κακήν σφιν Ζεὺς ἔδωκεν αὐόνην, Zeus gave them all an evil drought.[632] Two, that the "crucial social and political developments in Greece (at that time)" created the impetus for the population to move to Paroikia where occupation continued without interruption.[633] Neither explanation seems compelling. An alternative explanation will be suggested once the archaeology of Paroikia is considered.

## *Despotiko*

Separated by a narrow channel on the west side of Antiparos, is the island of Despotiko where an Archaic sanctuary has been found (see Fig. 4.43). Despotiko has been identified as the ancient island *Prepesinthus* mentioned by Strabo (10.5.2-3, section 485) and Pliny (*HN* 4.66).[634]

[632] Archilochus fr. 230. Gerber, *Greek Iambic Poetry.* LOEB 259, 236. The fragment has no context for place or date; Mck. Camp II 1979, looked at failure of water-wells in the Athenian agora and literary evidence to postulate a drought occurred in the late 8th c. that was a causal factor behind settlement abandonments and colonization. Current opinion though is that the 8th c. saw the arrival of a wet phase. See discussion in Chapter 3; Broodbank 2013, 506; Morris 2013, 66-7; Sallares 2007, 19-20. The range of analytical techniques such pollen records, sediment cores to understand alkenone sea temperatures, and paleotemperature proxies derived from Greenland ice cores, among many others, make the understanding of climate a rapidly advancing field, see Drake 2012, 1862.

[633] Schilardi 1983, 182.

[634] Kourayos, Daifa, Ohnesorg, and Papajanni 2012, 93, n6.


***Figure 4.43 Map of Bay of Aghios Georgios, Despotiko, and Antiparos. From Google Earth.***

The site at Mandra consists of a temenos surrounding a sanctuary, as well as numerous rooms to the south of the temenos, and outbuildings between the sanctuary and the water (see Fig. 4.43).[635] On Despotiko, buildings Γ, Β, Η, Κ, Λ all to the north of the sanctuary, plus four unexcavated buildings on the islet of Tsimintiri, together with submerged structures along the Antiparos shore surrounding the west end of the Bay of Aghios Georgios, indicate a larger settlement perhaps in association with the sanctuary.[636] Ceramics date occupation at Despotiko from the Geometric to Byzantine period.[637] Within the temenos,

[635] Kourayos, Sutton, and Daifa 2018, 115, Fig. 1; Kourayos 2012.
[636] *AR ID* 2330, 2011, 'Despotiko – Tsimintiri.' Excavations conducted in summer of 2019, in which author participated, have revealed a large complex of buildings on Tsimintiri. No datable pottery has been found yet.
[637] Kourayos and Daifa 2017, 307-9, Figs 2, 3.

under Archaic buildings Δ and A, was an earlier apsidal Geometric building, with pottery securely dated to second half of the 9th century (see Fig. 4.44). This is the earliest structure found in the sanctuary.[638]

***Figure 4.44 Apsidal wall of Geometric building, corner of building Δ supported by wood.***

Ceramics are predominately open shapes; drinking cups and kraters, almost all Parian manufacture (see Fig. 4.45). Design motifs are linear patterns, birds, and on the kraters, wheels combined with other patterns. Imports are few, primarily from Attica and some so-called Argive monochrome vases.[639] The latest finds from this layer of the excavation date to early 7th century.

[638] Kourayos, Alexandridou, Papajanni, and Draganits 2017, 356 – 61, Fig. 20, Alexandridou is author of subsection discussing the Geometric building and finds; Kourayos and Daifa 2017, 308.
[639] Kourayos, Alexandridou, Papajanni, and Draganits 2017, 357, Figs 21-3.

***Figure 4.45 Geometric pottery from Despotiko.***

A deposit of ash mixed with earth together with animal bones was found against the inside curve of the apse.[640] The mixture of earth into the ash suggests to the excavators that this was likely a secondary deposit with ash removed from a hearth elsewhere. Activity associated with the Geometric period building looks to have peaked in the second half of the 8th century based upon the variety of shapes found and the quality of their decorations and craftspersonship.[641]

Cult activity at Despotiko continued uninterrupted, evidenced by continuity of building phases in Building Δ above the Geometric period structure. As discussed in Chapter 3, Late Geometric finds were found under the floor of room A1. A temenos was built around temple building A, the *hestiatorion* and an hypaethral altar in the second half of the 6th century.[642] Late Geometric and Archaic period

[640] *Ibid.*, 357, 360.
[641] *Ibid.*, 359; Kourayos and Daifa 2017, 308.
[642] Kourayos and Daifa 2017, 308-9, 311-13.

pottery were found in association with these structures. A monumental building program began in the mid-6th (Phase A, 560-550) and continued into late 6th century with construction of building Δ. The monumentalization of Despotiko occurred contemporaneously with the building of the Delion Apollo, the marble Temple to Athena, and other temples in Paroikia.[643]

## *Paroikia*

What grew into the *polis* of Paros, Paroikia, is on the south-side of the Bay of Paroikia (see Fig. 4.32, 4.40). The archaeology of Paroikia is challenging as the modern town sits on top of the ancient. Geometric period finds are very limited in Paroikia; two graves found under a potter's workshop, burials in the Vitzi cemetery, and pottery at the extra-urban sanctuary to Delian Apollo.[644]

***Figure 4.46 Pottery from Geometric Burial C under Pottery Workshop. From left to right, items 3258, 3253, 3254 Paros Archaeological Museum. From Hasaki and Kourayos 2017, Fig. 7.***

[643] *Ibid.*, 313.
[644] Kourayos 2018b, 79; see Hasaki and Kourayos 2017, 462-4, Figs 5-7 on pottery workshop excavations.

At the Skiadas plot in Paroikia, during excavation of Roman pottery kilns, three Geometric cist burials were found. Burials A and C were in the northwest part of the site at the same level. Context and pottery date the burials to Middle Geometric, *c.* 800-750 (see Fig. 4.46). Burial, B was to the west of burial A and had no associated artefacts or architecture to date it.[645]

The Vitzi cemetery, located on the waterfront just outside the eastern fortification wall, contains remains dating from second half of 8th century continuously to the Roman period.[646] Two polyandria of the late 8th century have been excavated, one contained 100 ceramic urns with cremated remains and the other 40 urns.[647] The cremated remains were contained in lavishly illustrated amphorae decorated with Late Geometric motifs and battle depictions (see Fig. 4.47). The collective burial appears to have been of young male warriors. In front of the polyandria, an Archaic period three-meter high stele has been found, most likely from the *Demosion sema* (public burials of honoured citizens).[648] Later Archaic period burials within the cemetery were in clusters of cist graves separated by low walls. Schilardi suggests the cremated remains of the polyandria represent warriors killed on some overseas expedition, or expeditions.[649] The remains though predate the founding of the Parian colonies at Parion and Thasos, making this assumption of distant voyaging speculative.[650] What the cemetery remains do suggest, is that

[645] Hasaki and Kourayos 2017, 462.
[646] Per personal discussion with Ph. Zafeiropoulou at Vitzi, the excavators choose not to excavate below the Geometric polyandria, consequently it is not known if earlier levels exist.
[647] Zafeiropoulou 2018, 65-71, Figs 2-6; Kourayos 2018c, 284-87, Figs 8, 9; Agelarakis 2017; Kourayos 2015, 37; Schilardi 2002, 239-240. The number of burials is uncertain. Schilardi 2002, 240 suggest a minimum of 200 adult males but Agelarakis 2017, 11 suggests a minimum of 118.
[648] Kourayos 2015, 37.
[649] Schilardi 2002, 240.
[650] Pre-colonial contact with Thasos *c.* 710 by the Parian Tellis could shorten this time gap. See Blondé, Muller, Mulliez, Kohl, and Sanidas 2008, 409; Tandy 2018, 20-1, n9 remarked that typically Greek warrior burials were at the battle site, the remains were not re-patriated. He suggests Naxos as the furthest possible battle site for these remains.

Paroikia was a vibrant, going concern in the later 8th century. This contrasts with the declining settlement evidence from the north of the island.

***Figure 4.47 Late Geometric Burial Amphorae from Vitzi Cemetery polyandria. From Paros Archaeological Museum.***

Architectural finds on the Kastro support this interpretation of a vibrant community. On top of the earlier Mycenaean settlement (now re-buried) are the remains of a marble Archaic period temple to Athena built 530-520.[651] Archaic schist foundation blocks underlay the marble stylobate (see Figs 4.48, 4.49).[652]

[651] Ohnesorg 2005, 143-7, Figs 8-10; Rubensohn 1917, 2-7.
[652] Kourayos 2015, 29, Drawing 4 on same page.

***Figure 4.48 Archaic period Temple to Athena Foundations, schist under with marble over, Paroikia.***

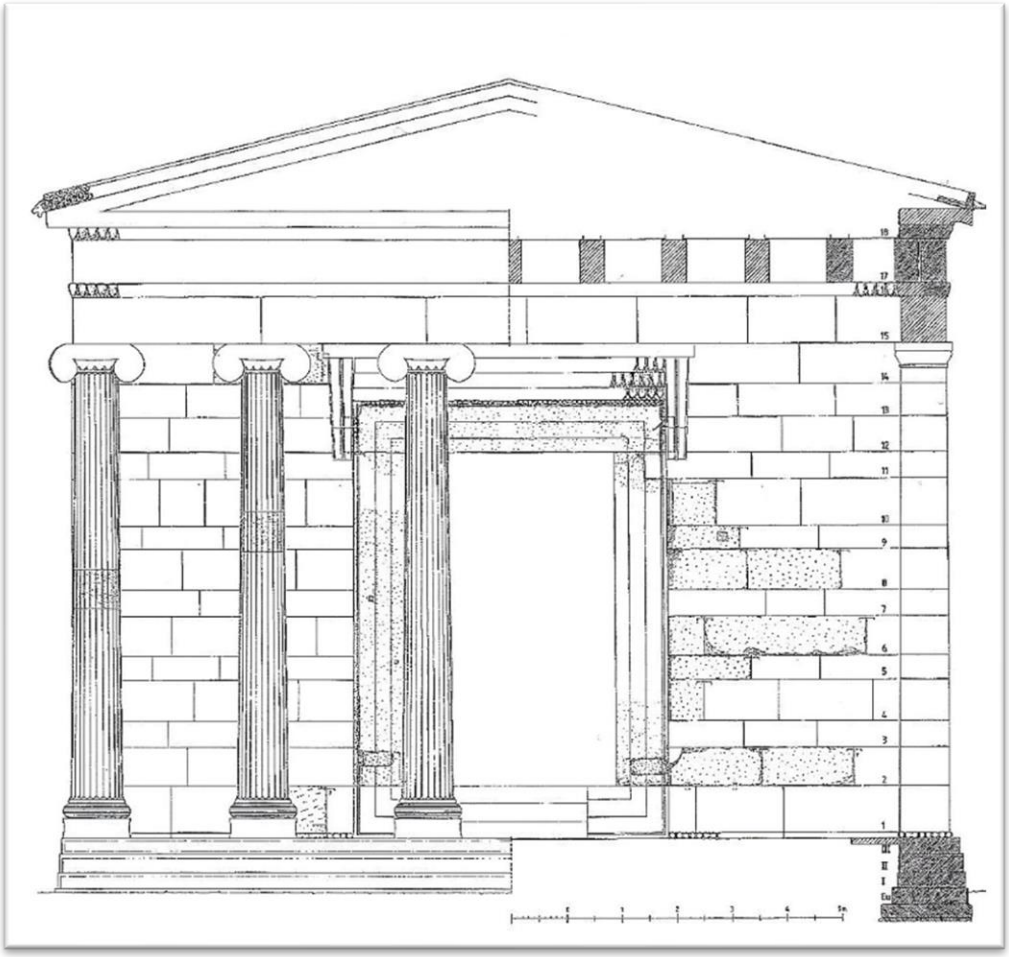


***Figure 4.49 Reconstruction Drawing of Paroikia Temple to Athena, Kastro Hill. From Ohnesorg 2005, Fig,10.***

Paroikia was surrounded by a defensive wall in the Archaic period (see Figs 4.50). Mostly Hellenistic traces of the wall are extant today, but Archaic courses are observable at several locations.[653] The size of the walled circuit is noteworthy (see Fig. 4.50). If we can accept Archilochos's language of the existence of a strong enclosure, and the archaeological footprint of the area of the wall, then the walled

[653] Schilardi 2002, 242-3. Archilochos used the phrase …ἐμ προαστίωι κε [(from Tarditi 1968 *Archilochus,* tetrametri fr. 99 (81 L.B.)]. Schilardi suggests προάστιον is the appropriate term for a large enclosure such as a city wall and that Archilochus was referring to Paroikia, though neither Paroikia nor Paros is mentioned in the poem. See Frederiksen 2017, 191, n7 on Thasos having walls.

city of Paroikia is quite large for the early 7th century.[654] Other cities, if fortified, enclosed only the very centre of the city (Minoa on Amorgos is an example). On the mainland, walls enclosing larger areas were not built until the end of the 7th century, Eretria being a good example.[655]

***Figure 4.50 Defensive Wall of Paroikia overlaid on modern city plan. From Kourayos 2018b, Fig. 1.***

To the north, across the bay from Paroikia, is a 150 m hill on which a series of cult structures occupied the summit.[656] The first structure was a hypaethral altar of the

[654] Kourayos 2018c, 281-2, Figs 3, 4; Frederiksen 2017, 186-7, Fig. 18.3; Schilardi 2002, 247-8 argued for an earlier smaller circuit in Paroikia but admits that there is no physical evidence to support this, just comparanda, the only extant physical evidence is of the larger circuit, which he described in Schilardi 1975, 85.
[655] Sakellaraki 1995, plan on p. 25.
[656] Rubensohn excavated the summit area in the 1920s, utilizing 20 workers over a period of just six days. Results were published post-war in 1962 just prior to his death.

9th and 8th centuries. In the Late Archaic, a monumental marble temple was built.[657] It originally measured 9.5 m by 6.0 m, featuring a cella and a pronaos, with two columns on a porch.[658] The space between the temple and the altar was marked by a thick black layer of earth, but no bones were found associated with the ash.[659] The earliest ceramics were Protocorinthian and Early Geometric.[660] Protocorinthian vases consisting of aryballoi, of which twenty pieces were well preserved.[661] Late Geometric Corinthian vases were found, but Rubensohn glossed over them in his report other than noting they bore oriental decorations in the form of running winged demons and animal motifs.[662] Other finds included a necklace consisting of 30 pieces of which 18 were faience scarabs from Naucratis, mostly attributed to the period of Amenhotep III, 7th century.[663] Rubensohn mentioned four Egyptian faience figurines in Late Geometric levels and remarked that Parian coins are of the earliest coinage found in Egypt, suggesting to him that Parian traders were in Egypt.[664]

In Paroikia, by the 7th century, many of the indicators of a *polis* structure are evident; nucleation of the island population at a central location, monumental architecture suggesting an urbanized city core, walled defences enclosing the *asty*, and the remains of citizen soldiers buried in honorific, mass grave structures. Archilochos's vocabulary from the first half of the 7th century, referred to the πόλις, ἄστυ, and προάστιον, confirming the development of Paroikia into a

[657] Ohnesorg 2017.
[658] Kourayos, Angliker, Daifa, and Tully 2018, 148, Fig. 12.
[659] Rubensohn 1962, 6.
[660] Rubensohn 1962, 8.
[661] Rubensohn 1962, 117-18.
[662] Rubensohn 1962, 125 Rubensohn may have used the term Corinthian to refer to a typology rather than a provenance; Kourayos, Angliker, Daifa, and Tully 2018, 150.
[663] Rubensohn 1962, 73-6.
[664] Rubensohn 1962, 169, Plate 35, figs 1-4.

nascent *polis* (see Fig. 4.51).[665] Reger suggested that rivalry with Naxos may have been the external force that prompted defensive-minded consolidation on Paros into a single *polis.*[666] The economic factors of marble mining and changes in trade routes seem more compelling as a driver for consolodation at Paroikia. Surely, multiple factors underlaid the processes of synoecism to a central, dominant *polis* center on the island.[667]

***Figure 4.51 Relief Stele from Archilocheion of Archilochos reclining on his couch with accoutrements hung on wall behind. From Paros Archaeological Museum, no. A758, 5th c. BCE.***

### 4.3.2.3 Economy

The Archaic period history and economy of Paros was the story of the exploitation of the marble resources of the island.[668] Significant marble deposits existed in the central highlands of the island to the east of Paroikia, primarily in the hills to the south of the plain of Marathi.[669] These deposits were mined industrially for the

[665] Schilardi 2002, n80 When Archilochos referred to his city's social and political aspects he used the term *polis*, its territory and physical aspects as an *asty*. The stele in Fig. 4.51 is from the 5th c. may or may not represent the 'tools of the trade' Archilochos used in the 7th c.. His poetry indicates he fought with a spear and a hopos (round shield).
[666] Reger 1997, 470; Demand 1990 suggested that outside threat was the principal motivation behind settlement consolidation (synoecism).
[667] Kourou 2011, 406.
[668] Kourayos 2018b, 79: "Η Αρχαική περίοδος είναι η «χρυσή εποχή» της Πάρου."
[669] Schilardi 2010a, 35-59 with numerous maps and photos; Korres 2010.

first time in the mid-7th century in both surface quarries and in deep mines.[670] Marble had been utilized on Paros in the Late Neolithic period at Saliagos and in the Early Cycladic period at Plastiras and Kampos where figurines and vessels were carved from white marble.[671] The Late Geometric period exploitation was of an entirely different magnitude when it became a preferred medium for statuary (for Paros 1 grade) and monumental display forms of architecture (for Paros 2 and 3 grades).[672]

Marble on Naxos was exploited earlier than on Paros.[673] Naxian marble is mined from surface deposits which facilitated the extraction of large pieces.[674] Compared to Parian marble, Naxian marble is coarser in grain and not as suitable for fine sculpture (see Fig. 4.52).[675] During the 7th century, marble was regarded as a 'the stone for the gods and heroes' and usage was largely constrained to ritual or funerary purposes.[676] The Parian marble (Type 1) referred to as *Lychnites* (λυχνίτης) usually came from deep mines rather than surface deposits and was noted for its almost translucent quality.[677] Light is transmitted through Pentelic marble 15 mm, Carrara 25 mm, and Parian *lychnites* 35 mm making it luminous. The stone is almost pure calcite.[678] Paroikia was transformed into a marble city in

[670] Gruben 2010, 138; A grave stele from the Vitzi Cemetery in Paroikia made from Parian marble is dated to early 7th c. by Mavrayani (2010, 155-61) but Kokkorou-Alevras (2010, 143) suggests this date is not universally agreed and estimates range from end of 8th c. to end of 7th c..
[671] Doumas 2000, 18-19, 24-5, 30-32; Herz 2010, 27 studied Early Cycladic marble artefacts kept in the Naxos Museum and determined that about 11% were made from Parian marble.
[672] Hochscheid 2015, 101-5; Herz 2010, 27; Herz 2006, Table 1, Paros Grade 1 lychnites, color white 9.5, translucent, grain size 0.2-0.55, Paros Grade 2 Chorodaki, color white/gray 0.5-3.7, grain size 0.35-1.3, Paros Grade 3 Aghia Minas, color white, grain size 0.5-1.1.
[673] Fullerton 2016, 24; Sturgeon 2006, 32.
[674] Lambrinoudakis 2005, 79.
[675] Herz 2006, Table 1, Paros Grade 1 marble Maximum Grain Size 1.4-4.8 with median of 3.3 while Naxian MGS 1.7-12.2 with median of 5.5; Pollini 2010, Fig. 5.
[676] Gruben 2010, 138; Tomlinson 2010, 139.
[677] The term Lychnites has a double meeting. Pliny (*NH* 36.14) recorded it meant the lamps the miners used. Others suggest it was from the light that seems to emanate from the stone. Which interpretation is correct is unclear, See Pollini 2010, 245, Fig. 10;
[678] Herz 2010, 28.

the 6th century evidenced by three marble temples built on the Kastro, one Ionic and two Doric temples in the *asty*, several marble altars, and at least ten Ionic style columns that were erected.[679]

***Figure 4.52 Top, close up of Archaic kouros from Naxos, bottom, close up of contemporary Archaic kouros from Paros. Both photos from National Archaeological Museum of Athens.***

[679] Kourayos 2015, 28-9, 42-9; Gruben 2010, 126 – 33, 138, Figs 3a, 3b, 5 – 12.

Evidence of wide-area distribution of marble from Paros by the late 7th century is considerable.[680] Parian marble was used in the construction of treasuries for Athens, Siphnos, Knidos, Klazomenai, and Massilia at Delphi in the 6th century.[681] The Siphnians used Parian marble for the construction of the agora and prytaneion according to Herodotus (3.57.4).[682] As described at Karthaia, usage was typically restricted to the carved elements of pedimental temple or civic building decorations, or the most visible first row of roof tiles, all a reflection of the suitability of the fine grained stone for sculpting.[683] Finds of Parian marble sculpture on Delos increased from mid-6th century to the extent that by the late 6th century, there were more sculptures made from Parian stone than Naxian.[684] Parian marble was imported by the Pisistratids for the pedimental sculptures of the Archaic Temple to Athena.[685] Beyond the Aegean, Archaic period Parian marble has been found over a wide area including Sicily, Rome and Etruria, Cyrene, Cyprus, and into the Black Sea.[686]

Three aspects of the wider trade in marble are noteworthy; the development of transport vessels capable of handling the heavy stone, heavy lift cranes for vessel loading, unloading and temple construction, and a payment system suitable to the

[680] Hochscheid 2015, 157-8; Gruben 2010, 128 "ta nahm ungeahnte Formen an" (taking on almost unimaginable dimensions); Kokkorou-Alevras 2010, 143, Figs 1, 3, 7; Sheedy 2006a, 115.
[681] Gruben 2010, 128, 138; Pedley 2006, 138-40, Fig. 74; Snodgrass 1983, 19; Wycherley 1978, 69, 274-5.
[682] Hdt. 3.57.4., text in Siphnos section.
[683] Tomlinson 2010, 141.
[684] Kokkorou-Alevras 2010, 145, 148, Figs 5 – 12; Sturgeon 2006, 32.
[685] Kokkorou-Alevras 2010, 150, Fig. 18; This use of Parian marble in Athens at this period is further supported by mason's marks on marble roof tiles. See Peppa-Delmouzou 2010, 329-40; Vlassopoulos 2010, 341-6.
[686] On Sicily see Castagnino 2010, 508, 511, 517, Fig. 13 confirmed Parian origin stone via geochemical and mineralogical/petrographic testing from ship wreck cargoes; Gorgoni and Pallante 2010, 497-506; on Rome and Etruria see Schilardi 2010b, Fig. 7; on Cyrene see Kane 2010, 479-81; on Cyprus see Karageorghis 2010, 469-78; on Lycia and Caria see Walker and Hughes 2010, and for the Black Sea refer to Alexandrescu-Vianu*, et al.* 2010, 427-35; see Herz 2006 on testing methods to determine provenance, stable isotope testing for oxygen and carbon isotopes as well as cathodoluminescence testing have proven to be the most robust.

requirements of the buyer and the seller in a pre-coinage economy.[687] As will be discussed, the early finding of solutions to these transactional challenges suggests an early adaptation of advanced trade practices which facilitated this financially attractive trade for Parian and Naxians.

In addition to the export of marble, Parian quarry and stone workers seem to have been in demand in the Archaic.[688] Cycladic craftspeople are credited with developing the diagonal himation design on Attic korai (Acropolis nos. 619 and 677).[689] The Parian Artison carved a funerary monument for Phrasikleia *c.* 540-530. Kritonides of Paros carved a statue of Artemis on Delos *c.* 520 as recorded in *IG* XII 5,216. The Parian Mikkiades engraved his name on statue bases in Delos.[690] During the 5th century many Parian sculptors travelled to Athens and Delphi for work.[691]

Paros was at the front of Greek colonizing practices in the 7th century, establishing Parion in the Propontis *c.* 710/705 and in the north Aegean at Thasos *c.* 680.[692] Unlike the traditional story recorded by Herodotus (4.149-162) and Thucydides (1.2) of sending out colonists to relieve pressure on food supplies, the foundation of these colonies appeared to have been economically motivated.[693] Morel commented that the primitivist view saw land hunger and overpopulation as the primary motivation for sending out colonies while modernists see commercial

[687] Hochscheid 2015, 137-45; Tomlinson 2010, 139; Snodgrass 1983, 22 estimated that annually a minimum of 270 tons of sculptured marble moved around the Aegean in the Archaic period, mostly in ships, the largest single piece known to have been transported was the base of the Colossus of the Naxians on Delos *c.* 600, 5.14 m by 3.47 m by 0.71 m = 12.66 m² about 34.32 metric tons. This suggests a ship with a near 50-ton displacement; see Sheedy 2010 on Parian coinage and marble.
[688] Fullerton 2016, 28-9; Snodgrass 1983, 19-21 on itinerant marble sculptors, artisans, and architects.
[689] Ridgway 1982, 124.
[690] Partida 2010, 357-8, n29.
[691] Partida 2010, 355, 357-61; Sheedy 2006a, 115-6; Korres 2001, 24, 47; on mobility of artisans in general see Vlassopoulos 2014, 85-94.
[692] Boardman 1999a, 229-30; Tsantsanoglou 2008 on Archilochos and Thasos.
[693] Malkin 2011, 152-54.

activities and access to raw materials as the principal motivations.[694] Tandy examined the mechanism of colony formation asking if it was a state sponsored or private initiative. He concluded that the literary evidence both near-contemporary with colony foundation and the later tradition pointed to an association of private individuals was the more common catalyst than was state initiative.[695]

Parion is on the Asian shore of the Sea of Marmara at the northeast end of the Hellespont. Eusebios wrote that Parion was founded in 709 but the foundation circumstances are unclear. Pausanias (9.27.1) attributed the foundation of Parion to Erythrai, Eustathios wrote that Thasos founded the colony, while Strabo (10.5.7) stated the colonization was done by Paros, but he also mentioned Miletus and Erythrai as possibilities.[696] The earliest archaeological remains are ceramics dated to 625-600. No architectural features from the earliest phases have been found.[697] Herodotus (4.138) mentions Parion in a list of Ionian cities along the Hellespont collectively deciding on how to respond to Darius's demands in the 6th century. The examination of metal slag in the Roman bath area suggest iron ore was locally sourced in Çakirköy and may have been worked as early as the Archaic and Classical periods.[698]

Thasos was rich in minerals and marble. These non-agricultural assets were speculatively the attraction of the island for colonization.[699] The Parian colonizers, as recorded in fragments of Archilochos, faced competition from both Thracians and perhaps Naxians in claiming Thasos.[700] Eventually, Paros did manage to secure

[694] Morel 2007, 489.
[695] Tandy 2018.
[696] Keleş 2018, 179; Boardman 1999a, 241.
[697] Keleş 2018, 179, Fig. 2.
[698] Çelikbas 2018, 224, 228, Table 2.
[699] Sanidas, Malamidou, and Nerantzias 2018, 251-8.
[700] Archilochos B($E_2$) col. I, Inscription of Sosthenes A col. Ia, col. IVa, see LOEB 259, 24-33.

Thasos as their own. Thasos proved to be a very successful colony economically as Herodotus recorded:

> ἡ δὲ πρόσοδος σφι ἐγινετο ἔκ τε τῆ ἠπείρου καὶ ἀπο τῶν μετάλλων ἐκ με γε τῶν ἐκ Σκαπτησύλς τῶν χρυσέων μετάλλων τὸ ἐπιπαν ὀγδώκοντα τάλαντα προσήε, ἐκ δε τὼν ἐν αὐτη Θάσω ἐλασσω μὲν τούτων, συχνὰ δὲ οὕτω ὥστε τὸ ἐπιπαν Θασίοισι ἐοῦσι καρπῶν ἀτελέσι προσήιε ἀπό τε τῆς ἠπειρου καὶ τῶν μετάλλων ἕκαστου διηκοσια τάλαντα, ὅτε δὲ τὸ πλεῖστο' προσῆλθε, τρινκόσια. (Hdt. 6.46-7)
>
> They derived their revenues from the mainland and from the mines on their own island. From the gold mines at Skaptesyle they usually collected a total of eighty talents, and from those in Thasos somewhat less but still a great amount that the Thasians, who do not even pay taxes on their crops, regularly derive 200 talents annually from the mainland and the mines, and when revenues are at their highest, they obtain 300 talents. (trans. A. Purvis)

The colossal *kriophoros* of Thasos, carved from Thasian marble, indicates that marble working in Thasos was undertaken in last quarter of 7th century.[701] The marble was mined using the Parian quarrying technique of carving the short sides of a block vertically, then splitting and levering up the long horizontal side with metal wedges. This same technique was used on Thasos throughout the Archaic period.[702]

[701] Holtzman 2010, 415, Figs 3, 4.
[702] Kozeli and Wurch-Kozeli 2010, 417-26.

Epigraphic evidence suggests that Paros and Thasos had a continuing relationship after the colony's foundation. An inscription found on Thasos dated *c.* 550 or 520, recorded that Akeratos was an archon in both Paros and Thasos (*IG* 12.8 supp.412). Sheedy suggested this implied close-ties and that probably Parians owned land and property on Thasos.[703]

Minted coins originated in Lydia *c.* 650-625. By the middle of the 6th century, the Lydians issued gold and silver coins.[704] Aglaosthenes (Pollux 9, 83) claimed that Naxos was the first to mint coins while Strabo (8.6.16) suggests Aegina was first. Regardless, the Cycladic islanders were among the first to adopt coinage, with ten Cycladic *poleis* minting coins between 540-480.[705] The earliest Cretan coins were not issued prior to 470.[706] The Cycladic issuance of minted coinage in the later 6th century further suggest the Cyclades were a conduit of intellectual innovations from east to west.[707]

Paros became a prolific Cycladic minter between 525 and 470.[708] Parian coinage consisted of silver staters and drachms struck on the Aeginetan standard, bearing a type of goat on the obverse. Often the goat is standing on a fish as seen in a large hoard found on Paros (*IGCH* 13).[709] The origin of the silver used in Parian coinage

[703] Sheedy 2006a, 117.
[704] Bresson 2016, 264-5; Osborne 2009, 237-46. N.B. coinage refers to precious metal stamped with an impression suggesting state authority. Prior to coinage, lumps of undecorated precious metal referred to commonly as 'bullion' likely circulated for several centuries (personal conversation with K. Sheedy, many thanks to him for this kind insight.); Osborne 2009, 242 unmarked lumps from Ephesus were issued in fractions of a full stater's weight.
[705] Sheedy 2006a, 1, Table 1. Sheedy cataloged the Cycladic coins in a comprehensive manner with numerous plates and commentary; Kraay 1976.
[706] Sheedy 2006a, 4-5; Stefanakis 1999, 249-51.
[707] Sheedy 2006a, 4, Table 3.
[708] Sheedy 2006a, 93; 2010, 119-20.
[709] Sheedy 2006a, 93-4, Plate 12 items 1, 2, Plate 19 item Pa 50.

is untested. The silver resources of Thasos and Siphnos seem likely but remains uncertain.[710]

The rapid acceptance of coinage in the Greek world was arguably propitious for Paros as a purveyor of expensive marble. This would be especially true for state to state transactions where state issued coinage could be used to pay for Parian marble used in state-funded temple construction.[711] Coinage would have lowered transaction costs for large scale purchases.[712] As noted, the Parians went on a building spree in Paros late in the 6th continuing into the 5th century, with the construction in marble of urban and extra-urban temples. State payment for these expenditures for both materials and labour were likely a combination of Parian coinage, non-Parian coinage, bullion, and commodities.[713]

Parian ceramics have been found over a wide area.[714] Parian sherds were found at Al Mina.[715] Late Geometric period Aa and Wheel Group designs have a broad distribution with finds in Aegina, Delos, Itanos, Melos, Rhenia, Siphnos, and Thera (see Figs 4.47, 4.53. 4.54).[716] The so-called 'Melian ware' is now generally acknowledged to have been Parian.[717] The variety of shapes and designs as well as the broad distribution of Parian ceramics, suggests this was an important industry.

On the eastern side of Antiparos at Ayia Kyriaki, a Hellenistic pottery workshop was found that produced amphorae for wine exports. Three different amphorae

[710] Sheedy 2006a, 117.
[711] Bresson 2016, 274-6 states issued money at times of war and for public construction citing Rhodes as an example; Sheedy 2006a, 117-8 on state minting and public expenditure.
[712] Bresson 2016, 268-9.
[713] Van Wees 2013b, 461-2; Sheedy 2006a, 118-9 suggests that Parian issues were not large enough in the late 6thc. to pay for all the work undertaken and suggested a combination of sources for payments.
[714] Zafeiropoulou 2017 on Parian ceramics in Cycladic mortuary and sanctuary contexts.
[715] Coldstream 2009, 176.
[716] Paspalas 2012, 80; Papadoupoulos and Smithson 2002, 163-6, 175, 178-9; Boardman 1998; Sheedy 1990; 1985, 188-9; Schilardi 1983, 182.
[717] Boardman 1998, 110-2, Figs 250-254.

designs were produced there with three different stamp marks: ΠΑΡΙΩΝ, ΓΟΡΓΟΥ, ΚΛΕΩΝΟ. Fragments of Archaic and Classical pithoi and painted fineware were also found as well as pyramidal objects designed to hold amphorae in position in the kiln.[718] The diachronic range of finds suggests the workshop had been in business for several centuries. A ceramic production facility with three kilns dated to the early Roman period was excavated in Paroikia.[719] A recently discovered kiln is under examination near the northeast corner of the Bay of Naousa.[720]

[718] *AR ID* 2141, 2011, 'Antiparos, Aghia Kyriaki.'
[719] Hasaki and Kourayos 2017, 462-4, Figs 5-7.
[720] Personal observation.

***Figure 4.53 Top: Parian, from purification trench on Rhenia. Note linear vertical lines, a common Parian marker. From Mykonos Archaeological Museum.***

***Figure 4.54 Bottom: Parian, from purification trench on Rhenia. Note zig zag motif, another common Parian marker. From Mykonos Archaeological Museum.***

#### 4.3.2.4 Summary

The development of Paros during the Geometric and Archaic periods was quite dramatic. Building from a violent destruction level at Koukounaries at the end of the Late Bronze Age to a thriving *polis* at Paroikia, enclosed by an expansive wall with several marble temple complexes, indicates both social and economic developments of significance. The social changes that culminated in a *polis* structure wherein authority was granted to non-family members, appears to have been a peaceful, internal process (discussed in detail in section 5.4). The strife seen in Archaic Athens and Sparta where an outside agent (Draco, Solon, Lycurgus) whether legendary or real, had to be brought in to organize a fractious citizenry is not apparent in Paros.[721] The writings of Archilochos give unusual insight to Late Geometric/Archaic Parian society, and in the surviving corpus, internal agitation seems *de minimis*.

Among the Cycladic islands, Paros was rich agriculturally and, in most years, apparently was self-sufficient for food. It was the additive economic impact of marble extraction and marble carving that created the hyper-economy for the island in the 7th century and thereafter. Certain aspects of the marble exploitation are unclear. Marble had been in the ground of Paros for millions of years; we do not know why it was not mined prior to the 7th century. Relations with Egypt (discussed below under Naxos) may have some clues. Nor do we know if the mines were organized as a state enterprise or as a private, perhaps clan based, entrepreneurial activity. In 5th century Athens and perhaps earlier, the mines at Lavrion were owned by the state, and the mining concession was leased out to

[721] See Bohen 2017, 1-13, 49-97 on Athenian Iron Age political turmoil and pottery developments; Raaflaub, Ober, and Wallace 2007, 22-83 on development of the *polis* in Athens and the social elements involved therein.

private individuals. The state received a payment for the concession.[722] In Corinth *c.* 600, the state under Periander built the *dolkos* across the isthmus from which tolls and harbour dues reduced taxes (Aristotle frag. 611.20).[723] As discussed, the silver mines on Siphnos seem to have been communally owned. We do not have evidence that suggest how marble extraction in Paros was organized.

Speculatively, technologies of extraction and haulage to move the marble may account in part for the probable movement of population from the north of the island to Paroikia during mid-7th century. Transporting marble north for shipment from the Bay of Naoussa required moving the stone either over a mountain range or northwards through a winding valley from the east-end of the Marathi plain. Moving blocks to Paroikia was all-downhill (see Figs 4.55, 4.56). Utilization of the downhill Paroikia route may have changed the focus of the island to a centralized urban centre with outlying small farmsteads, different from the Middle and Late Geometric arrangement of scattered villages in the north. Tandy suggested that late in the 8th century, civic market centres developed for the exchange of agricultural products. This put distant rural farmers at an economic disadvantage regarding the rate of exchange they received for their products compared to close-in farmers.[724] This may have been one of several factors that contributed to a move towards an urban centre.

[722] Bresson 2016, 274-5; Van Wees 2013a, 14; Aristophanes *The Wasps* 650-668 "Add to that the revenue from taxes, percentages, deposits, the mines, market and harbor dues, rents and confiscations…"
[723] Van Wees 2013b, 461, n58.
[724] Tandy 2008, 236.

***Figure 4.55 From mines looking north.***

Hills in front must be crossed over to get to Bay of Naoussa. Deep lychnites mines to immediate right of photo, surface quarry debris on top right.

***Figure 4.56 From edge of plain at Marathi looking west to Paroikia. Surface quarries to left of photo.***

Paros added to its collective wealth in the 7th century with the successful establishment of the colony on Thasos and activities on the Thracian mainland opposite. There is not sufficient evidence to allow quantification of the direct or indirect benefits to Paros. An analysis of the Parian coinage to determine the source of the silver bullion would be very interesting. If Thasos was a major supply source (which seems likely but unproven) this would enhance the direct benefits.

As discussed, we can get a relative approximation of the economic output of each island by examining the amount of tribute they paid. In the 425/424 high assessment, Paros was assessed 30 talents, the next most in the Cyclades was 15 talents each from Andros, Melos, and Naxos (see Table 1). The Parians' fee was third most of the entire Delian League assessment of 425/424, behind only its colony Thasos (60 talents) and Thracian Abdera (combined with Dikaea to make one entry of 75 talents).[725]

The success of Paros did not go unnoticed by others and there was external conflict, especially with Naxos. Herodotus (5.31) and Diodorus Siculus (7.1) both suggested conflict between Paros and Naxos, indicating that for a few years Paros came under Naxian control *c.* 530.[726] The two islands seem to have been rivals in bestowing dedications on Delos as much as for 'bragging rights' as anything else. The competitive relationship between the islands will be discussed in the Naxos section. On Paros, the additive economic model coupled with peaceful social development seems to have been remarkable. Ephoros (in Stephanos of

[725] Meritt, Wade-Gery, and McGregor 1950, 122-4; also see Meiggs 1972, Appendix 14, section III Thrace, East of Strymon, column A9; The Thasian and Abderan amounts are marked as reconstructed by Meiggs.
[726] Kourayos and Daifa 2017, 316-7.

Byzantium *s.v.* Paros) called Paros εὐδαιμονεστάτην καὶ μεγίστην (prosperous and greatest) of the Cyclades at the time Miltiades invaded in 489.[727]

### 4.3.3 Naxos

#### 4.3.3.1 Introduction

Naxos is the largest and highest Cycladic island with an area of 412.4 km² and a high point of 999 m.. Naxos has the most arable land area as well, 98.3 km², 39% more than second most Paros (see Fig. 4.32). Naxos and Paros are separated by a channel slightly less than 6 km wide. Winds that flow between the two islands are compressed between the high mountains of Paros and Naxos, blowing harder through the strait separating the islands than around the outside of the two islands. The accelerated wind speed in the strait makes sea travel between the islands, and especially travel from south to north through the strait, more challenging than the distance would indicate.[728]

A series of high mountains run down eastern Naxos. The north and east coasts are steep and rugged with little arable land. The two primary agricultural areas on Naxos are, the western coast and its hinterland, and the inland central area. The inland valley is unique in the Cyclades (see Fig. 4.57). Both areas are well watered by rivers and seasonal streams. Exploitable natural resources include extensive marble deposits in the north-central area and, on the eastern slope of the central mountains, emery, an extremely hard abrasive stone used for marble polishing. Naxos is the only source of emery in the Aegean.[729] The main port and most populous town (Naxos Town, Kastro, or Chora, used interchangeably) formed

[727] Kourayos, Sutton, and Daifa 2018, 113-5 on wealth of Paros and Miltiades invasion; Hdt. 6.132-136.
[728] Heikell 2014.
[729] Sheedy 2006a, 86.

around the beaches near the western corner of the island. Naxos lacks secure natural harbours. On the southern tip of the island, the bays of Panormos and Kalados offer seasonal protection from northern winds but are exposed to southern winds. At Chora, the addition of harbour moles makes it the only fully protected harbour on the island.

Naxos provides the first clear evidence from burial and cult practices of social development discussed so far. Additional evidence from burial contexts observed on Tenos and Amorgos adds to our understanding. The material is presented along with some preliminary comments on an island by island basis. A full discussion of the combined evidence and its ramifications regarding social development occurs in chapter 5.

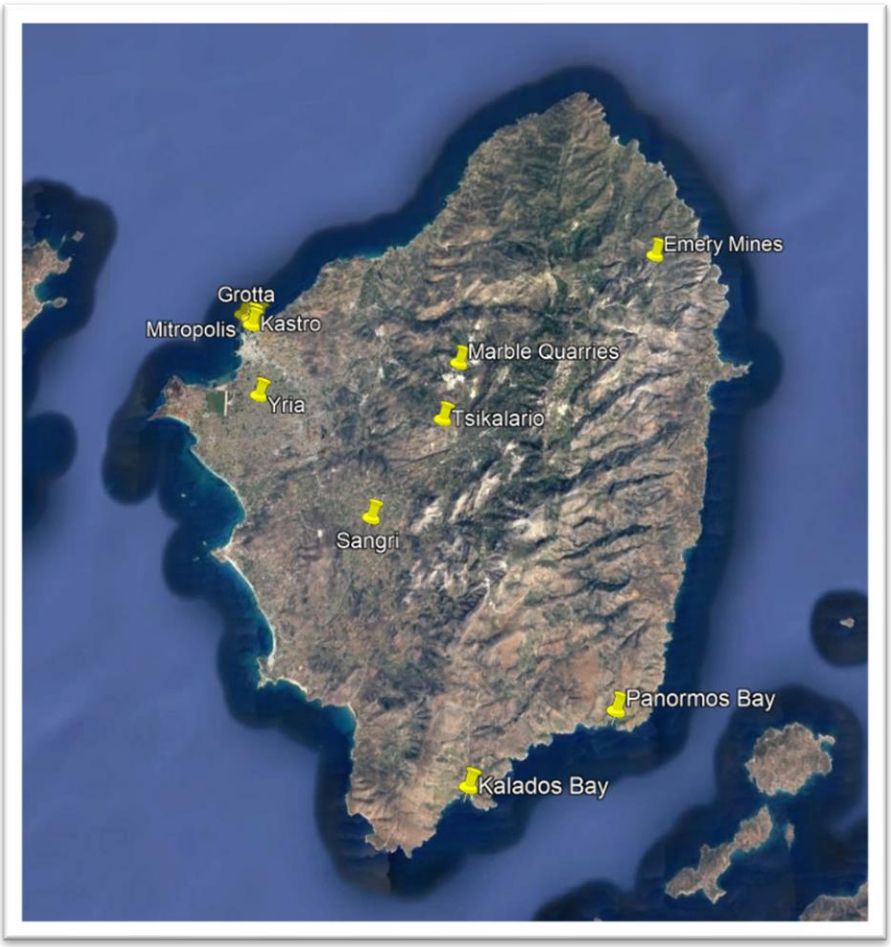



***Figure 4.57 Naxos. From Google Earth.***

#### 4.3.3.2 History

The most secure evidence in the Cyclades for continuity of occupation between the end of the Bronze Age and the Early Iron Age comes from Naxos.[730] The area of Grotta and associated cemeteries contains numerous burials and cult evidence dated to Protogeometric period.[731]

### *Grotta*


***Figure 4.58 Chora of Naxos and environs. From Google Earth.***

[730] Charalambidou 2018, 145; 2017, 375 maintained that it is the only Cycladic island with evidence for continuous occupation from beginning to end of the Iron Age.
[731] Sfyroera 2018, 327; Kourou 2015, 83, n4 stated that Protogeometric period burial evidence in the Cyclades is confined to Naxos; Lambrinoudakis 1988, 235, n1.

A Late Bronze Age settlement extended 250 m along the northern shore of Naxos town.[732] Much of the settlement is now underwater or built over by modern structures making interpretation challenging (see Fig. 4.58). To the east of the settlement were two cemeteries: Aplomata adjacent to the settlement, and 500 m further east at Kamini. Rescue digs have uncovered a southern cemetery (perhaps multiple cemeteries) south of Kastro.[733] Early in Late Helladic III, there was evidence of destruction at Grotta, attributed to earthquake activity as ocean sand covers the stratum, suggesting inundation. In Late Helladic IIIB, the settlement was rebuilt on a smaller footprint. A fortification wall built in Late Helladic IIIC excluded a portion of the earlier town.[734] The settlement at Grotta appears to have been abandoned at end of Late Helladic IIIC. On top of the abandoned settlement, seven Protogeometric graves and pottery were uncovered as well as three Protogeometric tombs in the adjacent Aplomata cemetery (see Figs 4.58).[735] Almost all Protogeometric graves were disturbed or without finds. Grave 12 from Aplomata contained a one-handled cup with three sets of compass-drawn concentric circles on the shoulder, evident of the new Protogeometric style (see Fig. 4.61).[736] Pottery imports found in Late Protogeometric contexts at Grotta and in the north Plithos cemetery were overwhelmingly Euboean.[737] The continuous burial evidence suggests that the settlement moved nearby, probably further inland and higher, away from the encroaching sea but this has not been archaeologically attested (see Figs 4.63, 4.64).[738] Later treatment of the Protogeometric graves was intriguing. At the end of the Protogeometric period,

[732] Thomatos 2006, 206.
[733] Charalambidou 2018, 145, Fig. 1.
[734] Thomatos 2006, 206, 256.
[735] Charalambidou 2018, 144-49; 2017, 375-6; Sfyroera 2018, 328-30; Thomatos 2006, 255; Mazarakis Ainian 1997, 188-9; Lambrinoudakis 1988, 235.
[736] Kourou 2015, 85, Figs 2, 3a-b.
[737] Charalambidou, Kiriatzi, and Müller 2017, 113, 116; Kourou 2015, 89, 91-2.
[738] Lambrinoudakis 2004, 61-2 suggested the Protogeometric settlement moved just south to the hill of Kastro.

enclosures were built around the graves on top of the Late Bronze Age levels of Grotta and those in the excavations of Mitropolis Square (contiguous with Grotta – see Fig. 4.58). Thick ash layers in pyres and remains of funerary meals on top of the graves within the enclosures were dated to Early and Middle Geometric periods (see Fig 4.62).[739] Prior to 800, these first enclosures were rearranged, enlarged and situated on a higher level, often without regard to the exact location of the grave below.[740] These enlarged platforms contained improvised platforms for meals and basins for purification (see Figs 4.59, 4.60).[741] Similar platforms were found elsewhere such as at Xobourgo on Tenos (discussed in section 4.4.2.2), at Xeropolis in Lefkandi, Mende-Proasteion in the Chalcidice peninsula, and, similar to Naxos, in association with Mycenaean fortification walls at Kyme and Vigatouri on Euboea - suggesting a continuation of Euboean contact with Naxos, first seen in pottery mentioned above.[742] At the end of the Late Geometric period, *c.* 700 or just before, the enclosures near the ruins of the Mycenaean fortification wall were covered by a 20 m diameter ellipsoid tumulus. The entrance to the Archaic and Classical agora was built next to this tumulus. Offerings dating as late as the 6$^{th}$ century based on pottery, have been uncovered.[743] Lambrinoudakis remarked that the progression of structures followed a heroization of the ancestral dead monumentalized with the Late Geometric construction of the tumulus which, by incorporating remnants of the Mycenaean wall in it, suggests the veneration of a mythical Bronze Age past.[744] The only other Cycladic site with a tumulus covering

[739] Kourou 2015, 92 referred to the enclosures and platforms as a "memorial park"; Lambrinoudakis 1988, 238.
[740] Lambrinoudakis 2004, 62; Mazarakis Ainian 1997, 188-9, Figs 330-3.
[741] Kourou 2015, 92; Lambrinoudakis 1988, 240, Figs 19-20.
[742] Kourou 2015, 93-7.
[743] Lambrinoudakis 1988, 244.
[744] Sfyroera 2018, 332; Lambrinoudakis 2004, 62; 1988, 245.

graves near a prominent public focal point is Minoa on Amorgos.[745] Generally, 'heroization' of the dead was not a common practice in the Cyclades.[746]

***Figure 4.59 Mitropolis grave enclosure, Phase 2 with sema marker.***

[745] Marangou 2002b, 224.
[746] Mazarakis and Leventi 2013, 219, n29.

***Figure 4.60 Mitropolis, Phase 3 circles with purification basin, krater, and pottery.***

***Figure 4.61 Protogeometric pottery from Aplomata Tombs, 10th c.. From Naxos Archaeological Museum.***

***Figure 4.62 Middle Geometric Pottery from Naxos Town cemeteries, 9th c.. From Naxos Archaeological Museum.***

***Figure 4.63 Late Geometric pottery from Naxos Town Cemetery, 8th c.. From Naxos Archaeological Museum.***

***Figure 4.64 Late Geometric Pottery from Naxos Town Cemetery, 8th c.. From Naxos Archaeological Museum.***

## *Yria*

Evidence of continuity from the Late Bronze Age was also found at the extra-urban shrine at Yria, four km south of Naxos Town (see Figs 4.57, 4.58). Excavation of a Late Bronze Age open-air altar suggests cult activities developed there, most probably during Late Helladic IIIA2-C.[747] Strata containing Late Bronze Age, possibly LHIIIC, Protogeometric, and Geometric ceramics were excavated in the area where a series of later buildings were constructed, suggest continuity of open-air cult activities into the 10th and 9th century.[748] A stone lekane found 65-70 cm directly under the centre of the subsequent Archaic temple was thought to have been the focus of earlier open-air cult activity.[749] A small building measuring 9.5 m by 5.0 m was constructed *c*. 800 that could accommodate a small number of people inside, together with an area outside for sacrifices and communal meals

[747] Charalambidou 2017, 375.
[748] Lambrinoudakis 2004, 63.
[749] Simantoni-Bournia 2002, 270.

(indicated by a find of calcinated animal bones).[750] A foundation offering consisting of a well-preserved bovine skull and a Middle Geometric I/II jug securely dated this phase.[751] The phase 1 building was replaced with a larger structure *c.* 730 (phase 2) measuring 16.5 m by 11.0 m divided by three rows of internal columns creating four naves. This building had a large hearth at its centre and benches along the sidewalls suggesting all cult activity could be accommodated within the structure.[752] A phase 3 cult structure was constructed *c.* 680. The north, east, and west walls were directly above the phase 2 walls; the south wall was extended, making the building 17.0 m in length. A four-column porch, with the columns set on bases, and a massive foundation, gave the phase 3 structure a monumental appearance (see Fig. 4.65). Late in the 7th century, the sanctuary was remodelled with the construction of a temenos, a banquet hall at the entrance, and the construction of a large Ionic-style temple in marble measuring 28.33 m by 13.5 m, fronted by a large Ionic altar (see Figs 4.66, 4.67).[753] Pottery from this phase include fragments from an East Greek Subgeometric bird-bowl and a Naxian version of a Protocorinthian kotyle.[754] The sanctuary at Yria preserved in clearer definition than most any other site, the evolution of cult structures that suggest a series of social changes.

[750] The excavation reports referred to each phase as a temple. Here the term cult building has been used until a marble structure with columns was built which is then referred to as a temple suggesting the temple is an architectural development. Thanks to Dr. Petsalis-Diomidis for this observation.
[751] Simantoni-Bournia 2002, 271.
[752] Lambrinoudakis 2004, 63, Fig. 4; See Mazarakis Ainian 1997, 189-190, Figs 334-7 for diagrams of all temple phases.
[753] Ohnesorg 2005, 137-8, Fig 1; Lambrinoudakis 2004, 63-4; Mazarakis Ainian 1997, 191.
[754] Simantoni-Bournia 2002, 273-5, Figs 2a, b.


***Figure 4.65 This very innovative diagram has the three building phases each printed on a separate pane of glass, mounted one over the other superimposing the structures. Phase 1 is the smallest, Phase 2 in rust, and phase 3 in grey. From Yria Archaeological Site.***

***Figure 4.66 Yria Temple Complex***

***Figure 4.67 Banquet Hall at Yria.***

## *Tsikalario*

The cemetery of Tsikalario, in the upland central plateau (see Fig. 4.57), is unlike any other cemetery area in the Cyclades, more reminiscent of stone-age Britain than the Aegean with large circles of orthostats surrounding burial tumuli (see Figs 4.68, 4.69).[755] Tsikalario was excavated in the 1960s by Zafeiropoulou and Doumas.[756] The burial ground consists of 40 – 50 stone enclosures of varying sizes. The largest enclosure had a twelve-meter diameter, dated to the 8th century.[757] The entrance to the zone is marked by a 2.5 m tall menhir (see Fig. 4.70). The

[755] Charalambidou 2018, Figs 5, 6, 7; Charalambidou, Kiriatzi, and Müller 2017, 110; Lambrinoudakis 2004, 69 suggested an "affinity" with Carian graves.
[756] Charalambidou 2018, 155- 167 discussed the site and finds in detail; see also Charalambidou, Kiriatzi, and Müller 2017, 109-111 on some of the pottery; Charalambidou 2017, 376-7 on the site itself as well as pottery; Original excavation report in *Archaiologikon Deltion* 21(1966).
[757] Mazarakis Ainian 1997, Fig. 338 for site diagram.

architectural emphasis was on monumentality.[758] Most of the stone circles contained cist graves, many of the graves had high quality pottery (see Figs 4.71, 4.72, 4.73).[759] Cist Grave 11 had a high handled kantharos (MN 3876), a flat pyxis of Naxian manufacture with Attic designs (MN 3881), and a Cypriot style two-handled juglet (MN 3877) noteworthy for being the only example of this type found in a burial context in the Middle Geometric period Cyclades.[760] Bird figurines made from Naxian fabric were also found in the grave as well as pithoid vessels outside the grave.[761] A few later burials found near the periphery of the tumuli date to Late Archaic and Classical periods.[762] Some building structures existed within the necropolis that most probably served funerary and cult purposes.[763] Rooms seven and eight in complex B had a central hearth and thick layer of burning residue on the floor. Zafeiropoulou suggested the buildings were still in use in the Archaic period (after burial activity had ceased) for the veneration of ancestors based on her dating of pottery. Others suggest dating the pottery to the Archaic period is problematic.[764]

[758] Lambrinoudakis 2004, 64.
[759] Charalambidou, Kiriatzi, and Müller 2017, 110; Charalambidou 2017, 377.
[760] Charalambidou 2018, 165-87.
[761] Charalambidou 2018 Figs 34, 38, 49; Charalambidou 2017, 380-4, Figs 5a, 5b, 7, 8a, 8b, 9a, 9b.
[762] Charalambidou, Kiriatzi and Müller, 2017, 110.
[763] Mazarakis Ainian 1997, 191-3, Figs 339-42.
[764] Mazarakis Ainian 1997, 193.

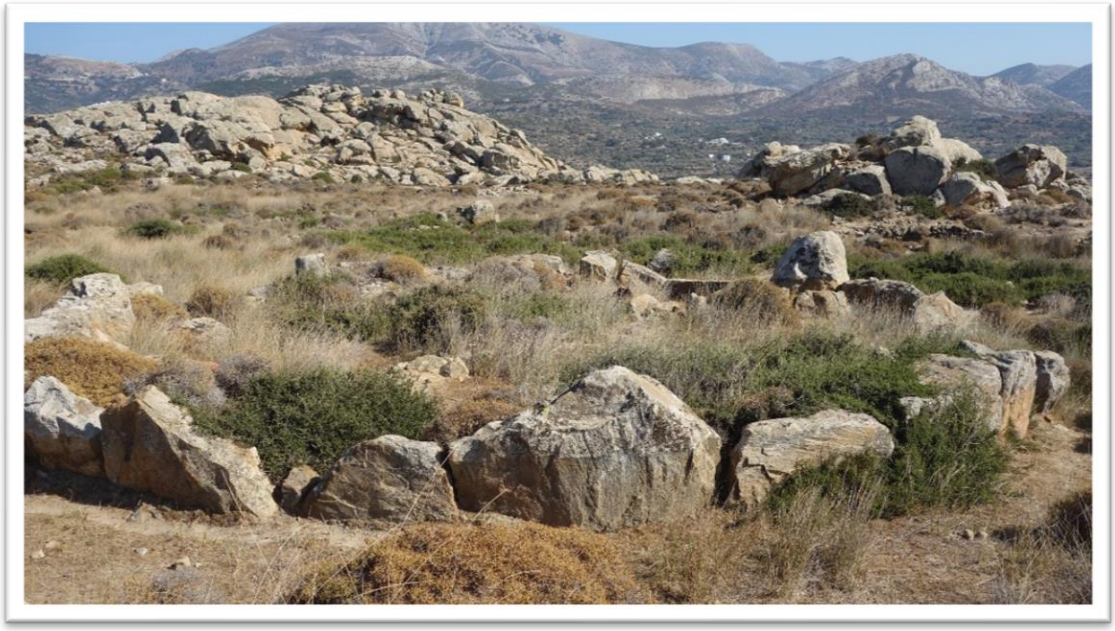
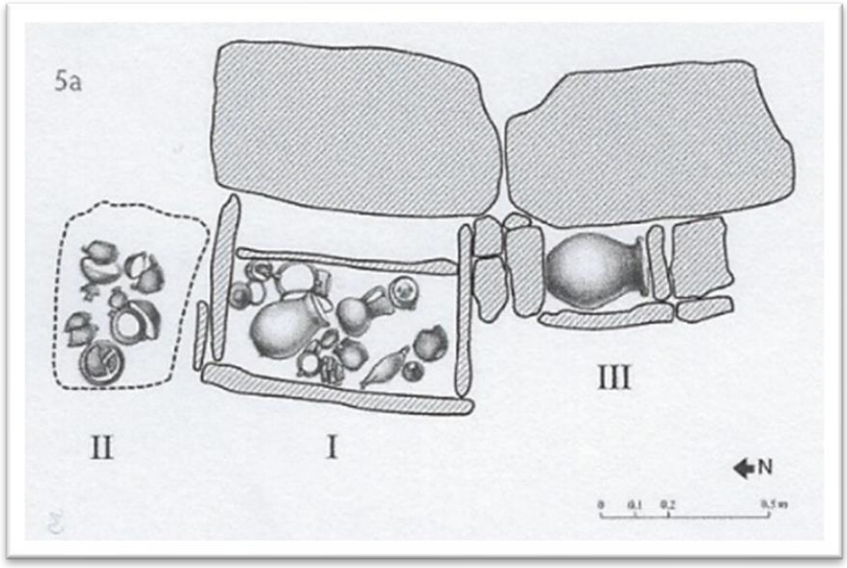


***Figure 4.68 Burial ring of orthostats at Tsikalario.***

***Figure 4.69 Another burial ring.***

***Figure 4.70 Tsikalario menhir marking burial area entrance, burial ring in foreground.***

***Figure 4.71 Ceramics from Tsikalario. Naxos Archaeological Museum. Unlabelled, preventing making an assignment to a tumulus or grave.***



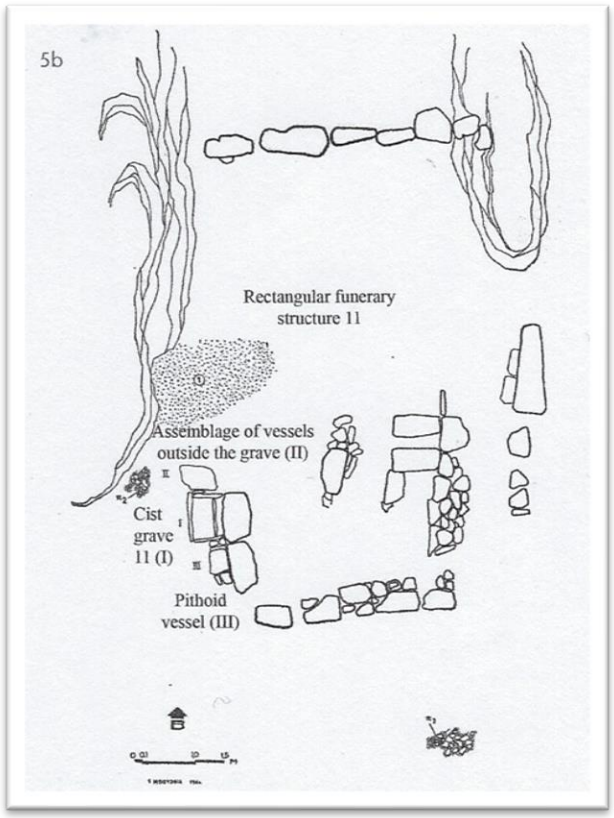




***Figure 4.72 Top: Diagram of Cist Grave 11. Bottom: Diagram of grave within tumulus context. From Charalambidou 2017, Figs 5a, 5b.***

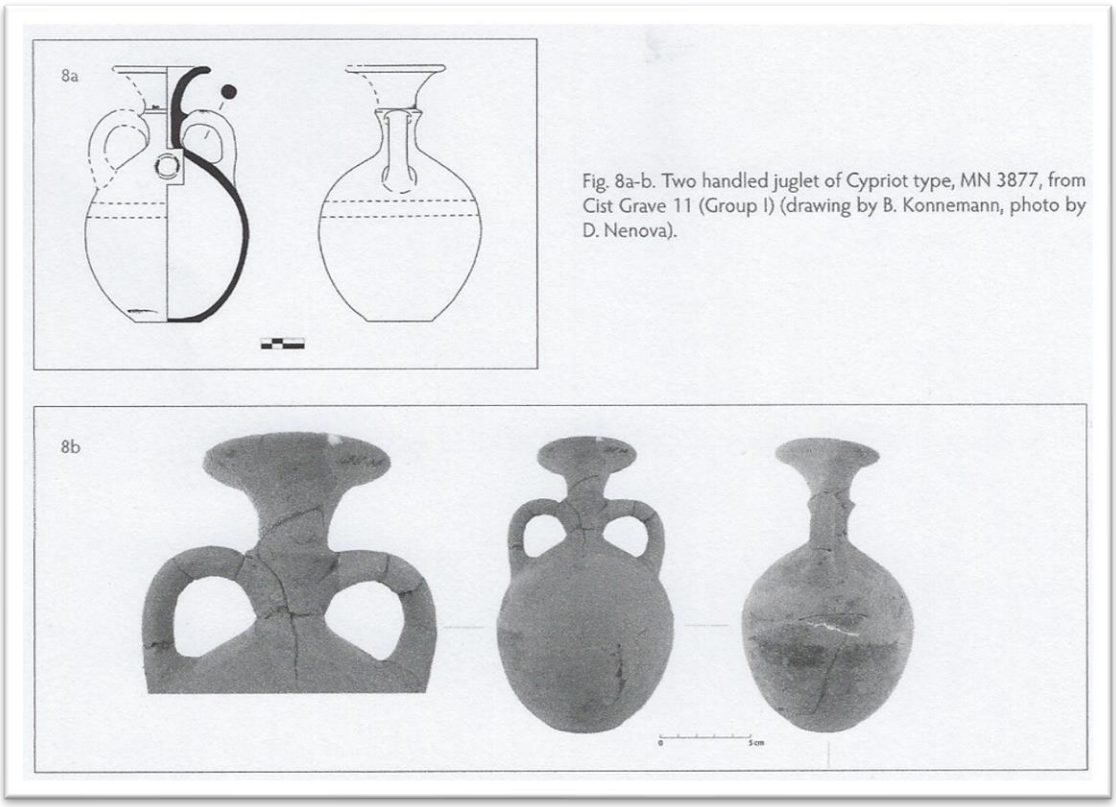




***Figure 4.73 Top: Kantharos from Cist Grave 11. Bottom: Cypriot style Two-handled juglet. From Charalambidou 2017, Figs 7, 8b.***

## *Sangri (Gyroulas) and Melanes.*

The sanctuary of Demeter near Sangri sits on top of a small hill in the middle of a large fertile inland plain in central Naxos (see Fig. 4.57, 4.74). The main temple building at Sangri is a monumental marble structure, perhaps dated to the late 6th century tyranny of Lygdamis (discussed below), or slightly later.[765] This monumental structure covers most of the area (see Fig. 4.75). Visible on the south side, underneath a section of the larger structure, were found an array of ellipsoidal holes in the rock (under plastic protective roof and in the foreground) with associated Geometric ceramics. (see Figs 4.75, 4.76).[766] A carefully built double pyre pit for libations dated to Late Geometric, suggests the earliest phase of worship to Demeter at Sangri was conducted in the open-air.[767]

To the north of Sangri is a small sanctuary in the valley of Melanes in the marble quarry region (see Fig. 4.57). A small building and places for open-air cult activities were built above a spring at Phlerio. Ceramic material dates the sanctuary foundation to late 8th century. The sanctuary flourished in the 7th and 6th centuries and continued to be used thereafter.[768] The first sacral building was a simple quadrangular *oikos* 5.0 m by 4.0 m built late 8th century. West of the *oikos*, an extended terrace was built (see Fig. 4.77). Ash from pyres containing animal bones, metal objects, and sherds were carefully covered with thin stone slabs separating successive layers of ash. The manner of worship suggests rites characteristic of a chthonic deity or a hero took place.[769] In the first half of the 6th century, following an earthquake or land subsidence that damaged parts of the buildings, the edifice was rebuilt in the shape of a Γ. Ash and bones from rear

[765] Ohnesorg 2005, 138-9, Fig. 4; Lambrinoudakis 2004, 65-7.
[766] Lambrinoudakis 2004, 65; Mazarakis Ainian 1997, n1981.
[767] Kourou 2011, 405.
[768] Lambrinoudakis 2005, 81.
[769] Lambrinoudakis 2005, 83.

rooms show that ritual feasting probably occurred.[770] Finds include terracotta figurines of a goddess and many items of unfinished marblework including votive columns, *kouroi*, and a sphinx, as well as dedications from quarrymen of their less-valuable works.

Water from the spring at Phlerio was conducted to Naxos Town, eleven km away, via an aqueduct built *c.* 500.[771] The Archaic period aqueduct utilized clay piping.

***Figure 4.74 Sangri in the landscape of internal upper plateau area of Naxos.***

[770] Lambrinoudakis 2005, 83.
[771] Sfyroera 2018, 335; Lambrinoudakis 2005, 79-80, Fig. 1; 2004, 67.

***Figure 4.75 Reconstructed Temple to Demeter at Sangri with Geometric pyre pits in foreground.***

***Figure 4.76 Geometric and Early Archaic pottery from Sangri, Sangri Site Museum.***

***Figure 4.77 The early oikos at Melanes. From Kourou 2011, Fig. 11.***

## *Discussion*

The evidence of continuity from the Late Bronze Age through the Protogeometric to the Geometric period is strong in Naxos Town and the nearby extra-urban sanctuary at Yria. Evidence of habitation from inland Naxos has a later date; 9th century at the earliest, and more securely with the 8th century.[772] The earlier establishment of Chora may explain why Naxos developed as a single *polis* island despite other fertile and mineral rich zones where other *poleis* could conceivably have been founded. Most of the Cycladic islands developed into single *polis* islands (Amorgos, Keos, and possibly Mykonos being the exceptions). That a second *polis*

[772] Sfyroera 2018, 331.

did not develop in the upper plateau area is perhaps surprising as it was geographically distinct from the western coastal plain.[773] The richness of the upper plateau arguably manifested itself in the burial practices seen at Tsikalario. Charalambidou suggest that the Tsikalario grave goods were slightly more ostentatious than those from the coastal cemeteries perhaps as an expression by the inland community that they were in some ways different.[774] Yet, on Naxos the one *polis* centre suggests that Cycladic islanders favoured a single *polis* structure.

The diachronic series of burial enclosures at Grotta culminating with the erection of a large tumulus incorporating the remnants of the Late Bronze Age fortification wall, suggests the veneration of a foundational generation(s). Speculatively, on Naxos it may have been social tension between the wealthy of Naxos town, able to claim an ancestral pedigree that the wealthy of the inland population could not match, that created conflict that Lygdamis was able to exploit resulting in his tyranny. Lewis suggested rivalry amongst the *aristoi,* rather than between the *aristoi* and the *demos,* is the explanation that best fits the ancient written tradition for the rise to power of tyrants in examples such as the story of the Bacchiads at Corinth (Hdt. 5.92β-3).[775] The rise to power of the tyrant Lygdamis in Naxos is recorded by Athenaeus and Herodotus, paraphrased below:

Aristotle's *Constitution of the Naxians* does not survive, but an excerpt was preserved in Athenaeus (*Deipnosophistae* 8.348). Athenaeus wrote: "τῶν παρὰ Ναξίοις εὐπόρων οἱ μὲν πολλοὶ τὸ ἄστυ ὠκουν, οἱ δὲ ἄλλοι διεσπαρμένοι κατὰ κὼμας." "Of the wealthy Naxians most lived in the city, the rest (of the wealthy) were dispersed in the villages." To paraphrase Athenaeus's story: One day a

[773] Sfyroera 2018, 327, 334; Charalambidou, Kiriatzi, and Müller 2017, 128 discussed stylistic and fabric differences between the inland and coastal pottery; see Reger 1997 on single vs. multiple *poleis.*
[774] Charalambidou 2018, 187, 189.
[775] Lewis 2009, 18-9; Hammond 1992, 343; Hdt. 3.82.3.

wealthy, well-respected gentlemen named Telestagoras and his two daughters were accosted in his village of Leïstadae by some apparently well-lubricated young bucks out on a spree. Many Naxians were deeply offended by the behaviour of the young aristocrats towards a respected member of society and a serious civil war (μεγίστη τότε στάσις) began. Lygdamis successfully applied his military leadership skills, put down the rebellion, and established a tyranny.[776] Presumably after achieving power (Hdt. 1.61.4), Lygdamis provided both men and money to assist the Athenian tyrant Pisistratus *c.* 555. Once Pisistratus was back in power, he sent the children of some of his Athenian opponents to Naxos as hostages (Hdt. 1.64.1). Eventually, the Spartans deposed Lygdamis *c.* 524 when they moved against Lygdamis's fellow tyrant Polycrates (whom Lygdamis helped to power) in Samos.[777]

Lygdamis's tyranny is the only story of internal civil strife during the Iron Age to come from any of the Cycladic islands. In all other cases, the archaeology suggests a peaceful transition occurred in the development of family organized society to larger clan-based units, to the eventual *polis* format in which power was voluntarily devolved to non-family members. This appears to have been the case in Naxos.[778] Features such as the large tumulus built prior to 700 at Grotta, indicated the formation of a larger societal structure beyond the clan, occurred more than a century before Lygdamis's rule as tyrant. An inscription from Dreros

[776] Rankin 1978 discussed possible parallels between this story and a contemporary tale of Archilochus abusing the Lycambids in ritual on Paros; Aristotle *Politics,* 1305a, line 41 wrote that Lygdamis was an oligarch. ἐν Νάξῳ Λύγδαμις ὅς καὶ ἐτυράννησεν ὕστερον τῶν Ναξίων.
[777] Plutarch *On the Malice of Herodotus,* 859; Leahy 1957 gave a short analysis of possible Spartan motivations for deposing Lygdamis arguing that the deposition of Polycrates was their larger objective; See Parke 1948, 106-7 on linkage between Lygdamis and Polycrates; Carty 2015, 14, 91, 99; Hdt. 5.92η "There is nothing in the whole world so unjust, nothing so bloody, as a tyranny."; *OCD Second Ed*., 507, Panyassis, Herodotus's uncle, was executed in 454 by Lygdamis II tyrant of Halicarnassus for participating in a revolt; see Andrews 1992, 402-4, 416 on Herodotus's general antipathy towards tyrants; also, Rhodes 2018, 269-73; Stein-Hölkeskamp 2013, 108-12 on Polycrates.
[778] Hall 2014, 204.

on Crete *c.* 650-600, specifying term limits for certain magistrates, is the first written evidence of the advanced stage of social devolution of power in the Aegean.[779] The rise of tyrants a century later in many Greek *poleis,* probably had more to do with issues of military leadership and disputes over the wealth generated in the late 7th and early 6th century and was not an aberration in the social transition from family to clan to city-state seen in the archaeological record of the 10th to 7th century.[780] This conclusion as it regards Naxos is supported by both the archaeology and the traditional written record.

#### 4.3.3.3 Economy

Herodotus also recorded a story of external conflict illuminative of the economic success of Naxos by the late Archaic period. *Circa* 500, a group of Naxian oligarchs fled to Miletus, then under the leadership of Aristagoras (Hdt. 5.30). Aristagoras, sensing an opportunity, travelled to Sardis and asked the Persians to finance an attack against Naxos. Aristagoras, attempting to entice the Persians, described the island as:

> Νάξος εἶν νῆσος μεγάθεϊ μὲν οὐ μεγάλη ἄλλως, δὲ καλή τε καὶ ἀγαθή καὶ ἀγχοῦ Ἰωνίης, χρήματα δὲ ἔνι πολλά.. Naxos is not as big as other islands, but it is fair and fertile, close to Ionia, and has a lot of money. (Hdt. 5.31)[781]

Mineral resources of marble and emery must have contributed a large share to the island's economy. Modern mining has obliterated most of the ancient marble

[779] Osborne 2009, 174-5, Fig. 47; for inscription see Jeffrey 1990, *LSAG* 311, no. 1a; Meiggs and Lewis 1988, 2; Fornara 1983, 11.
[780] Lewis 2009, 26-7; Hammond 1992, 343.
[781] Aristagoras, accompanied by a fleet of 200 Persian ships, besieged and damaged Naxos, but did not take it (Hdt 5.33-34). Herodotus remarked that the Naxians retreated behind their walls and withstood a four-month siege, indicating that the Naxians had built protective walls at Chora sometime in the 6th c.; see Hall 2014, 282-4.

works, consequently the primary production sites are understudied (see Fig. 4.87).[782] Quarries at Phlerio in Melanes have two rough-cut *kouroi* and unfinished architectural members *in situ* (see Fig. 4.84).[783] An examination of the output of marble from Naxos's quarries is the most expedient method to achieve an estimation of the scope of mining.[784] Ostentatious building and statuary remains attributed to the Naxians, found in Delos and elsewhere, gives the strong impression of an economically vibrant society in Naxos during the Late Geometric and Archaic periods.[785]

While many dedications at Delos came from wealthy individuals, the Naxians as a group dedicated buildings and enormous *kouroi* in the 7th and 6th centuries.[786] The earliest temple at Delos was dedicated by the Naxians.[787] Two parallel rows of holes in the bedrock, some with stone bases in them suggest the arrangement of the first structure (termed the pre-*oikos*) was 23.94 m long and 9.59 wide at the east end, 10.10 wide at the west end (see Fig. 4.78). The building had a door of Naxian marble with a marble basin and drain in the interior.[788] This building was replaced early in the 7th century (possibly earlier) with what has been termed the first monumental temple to Apollo raised in Delos, the *oikos* of the Naxians (see Figs 4.79, 4.80).[789] This building incorporated the first usage of marble for roof tiles.[790] To the north, around the west side of the sacred lake, at the end of the 7th century, the Naxians built the famous terrace of the lions with a series of statues

[782] Kokkorou-Alevras 1992, 101-127 is the most recent.
[783] Lambrinoudakis 2005, 79.
[784] Ohnesorg 2005, 142-3.
[785] Sheedy 2006a, 87.
[786] Fullerton 2016, 24; Osborne 2009, 197.
[787] Building Gamma may be earlier, constructions dates for the two buildings are not agreed, see Mazarakis Ainian 1997, 180.
[788] Courbin 1980, 29, 32, n1, Figs 1, 3; Mazarakis Ainian 1979, 180, Figs 312, 313; De Santerre 1958, 215-6, Plan B, Plates XXX, XXXI.
[789] Courbin 1980, 32-41 argued for third quarter of 7th c.; Mazarakis Ainian 1997 argued for end 8th c. or early 7th c; on building's details see Courbin 1980, 44-93.
[790] Courbin 1980, 81-9, Figs 24, 25, 27.

constructed of Naxian marble serenely guarding the early entrance to the sanctuary precinct.[791] Towards the harbour from the *oikos*, in the 6th century, the Naxians constructed a stoa that backed up the harbour quays to the west and adjoined the propylaea to the east.[792]

Grand works built with Naxian marble continued in the 6th century, best exemplified by the construction of a massive temple to Apollo on the islet of Palatia in Naxos Town (see Fig. 4.58).[793] Temple construction started *c.* 530 under Lygdamis but was never finished, as the Persian conflicts marked the end of over-sized Naxian construction projects. The planned design is unclear but foundational work for the cella walls measures 37.0 m by 15.5 m. The massive doorway is 6.0 m wide and 7.9 m tall.[794]

[791] Boardman 1978, Fig 269.
[792] De Santerre 1958, Plate IX, 16.
[793] Ohnesorg 2005, 141, Pl. 31A; Some argue Dionysius was being honored. See McGilchrist 2010(17), 41-3.
[794] Controversy surrounds the doorway. Bent (1885, 337) noted the doorway's existence when he visited the islet on Christmas Eve 1883, yet a 1925 photograph of Palatia has no doorway in it. In this author's opinion, the foundation blocking supporting the doorway seem too haphazard for ancient engineering, nor do the decoration motifs align with adjacent pieces. This suggests some reconstruction occurred.

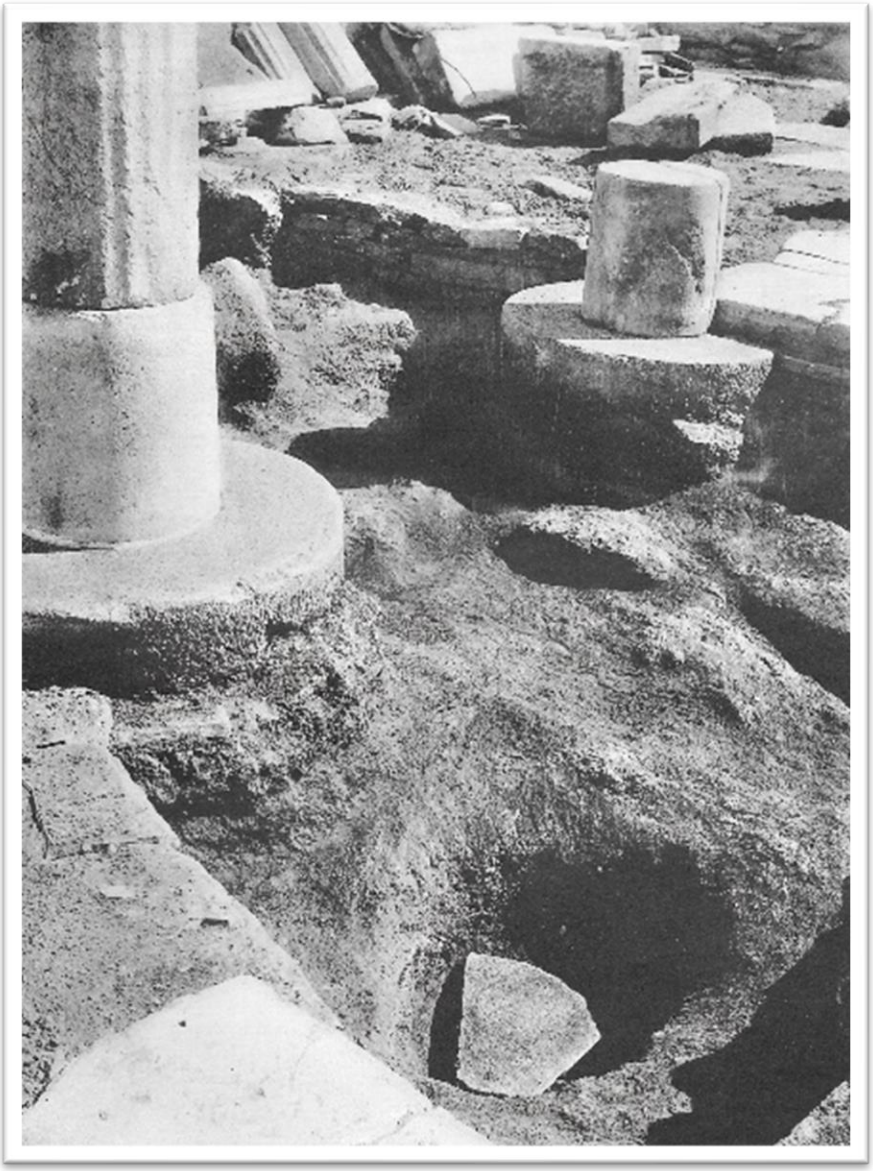


***Figure 4.78 Pre-oikos building level. From Santerre 1958, Plate XXXI.***

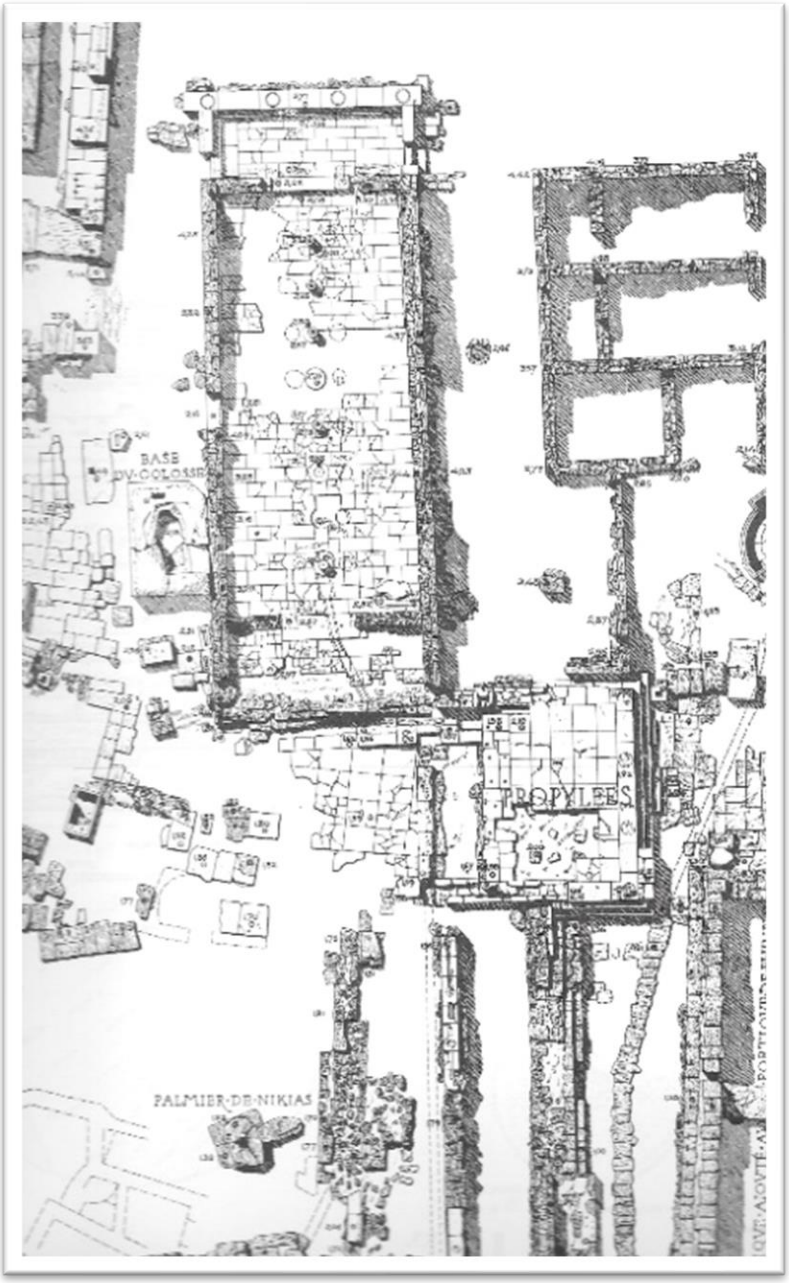


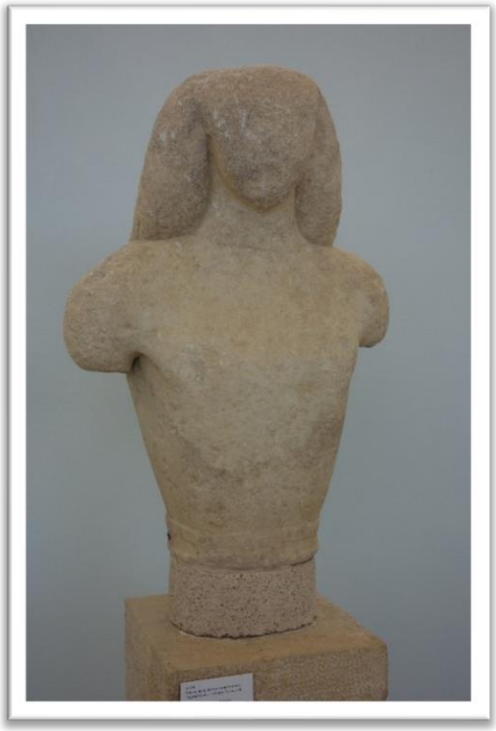

***Figure 4.79 Oikos of Naxians, Statue base to left, Propylaea, Stoa of Naxians to bottom. From Courbin 1980, Pl. 1.***

***Figure 4.80 Oikos of the Naxians, from east looking west.***

Turning to statuary as exempla of Naxian marble extraction and working: no hard-stone Greek statuary is securely dated prior to the hiring of Greek mercenaries by the Egyptian Pharaohs Psammetichos I (664-610) and Psammetichos II, roughly contemporary with the earliest Greek presence at Naucratis (see section 3.3.7 above).[795] The dating, design, and scale of the early Greek *kouroi* suggests the statuary concepts were imitative of Egyptian forms.[796] The earliest *kouroi* date to last half of 7th century and were all produced from Cycladic marble except for a few examples from Samian and Boeotian stone (see Figs 4.81, 4.82).[797] Many *kouroi* dating to the 6th century have been found in Athens and elsewhere in Attica,

[795] See Meiggs and Lewis 1988, 12-13; Fornara 1983, 24-5 on inscription from Abu Simbel left by Greek mercenaries employed by Psammetichos II.
[796] Fullerton 2016, 25-26; Carter and Steinberg 2010; Palagia 2006, 244; Boardman 2006b, 12; 1978, 18.
[797] Boardman 2006b, 13; 1978, 22-3 Fig. 58, the earliest Athenian kouros made from Pentelic marble dates *c.* 600 – 590 see 22-3, Figs 62, 63.

often made with Cycladic marble (see Fig. 4.83).[798] The statue design, origin of the stone, and market for early *kouroi* suggests the Cyclades were central to the earliest monumental Greek marble statuary.[799]



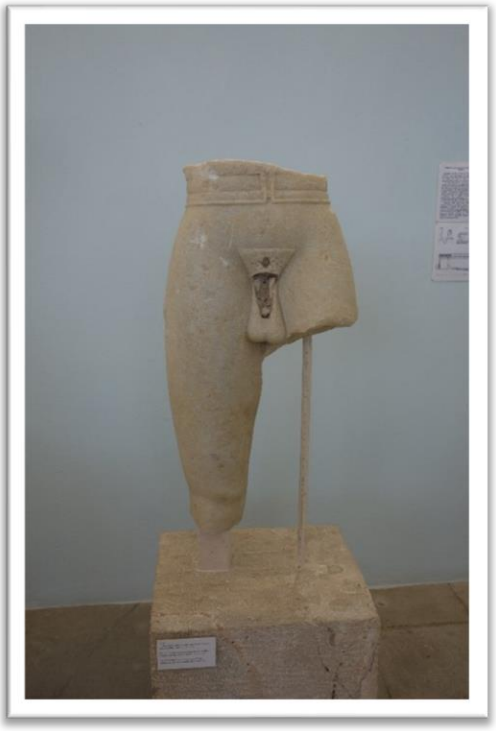


***Figure 4.81 Left: Naxian kouros, 650-625. From Delos Archaeological Museum, no. A333.***

***Figure 4.82 Right: Naxian kouros 625-600. From Delos Archaeological Museum, no. A334.***

[798] Fullerton 2016, 37; Boardman 1978, Figs 98, 99, 104-118.
[799] Hochscheid 2015, 118-20; Sheedy 2006a, 87; On Egyptian stone working see El-Sehily 2016; Aldred 1980, 20-23, Fig. 122.

***Figure 4.83 Left Kouros, c. 560-550 made from Parian Marble, found in Volomandra, Attica. Probably used as a grave marker. Right Kouros, c. 600 from Naxian marble, found in Sounion. From Athens Archaeological Museum, Nos. 1906, 2720.***

Earlier Greek sculpture utilized limestone and sandstone; stones that could be worked with wood carving tools.[800] Harder crystalline marble required iron tools such as the single point chisel, flat chisel, and the hard-abrasive emery to be worked.[801] Against the north wall of the Naxian *oikos* in Delos stood a monumental statue of Naxian marble, erected around the end of the 7th century. The statue was about 7.5 m tall and stood on a massive base, 5.14 m by 3.47 m by 0.71 m = 12.66 m².[802] A *kouros* base at Delos dated *c.* 600, was signed by Euthykartidas of Naxos (see Fig. 4.85). The Naxians dedicated an Ionic column topped by an iconic Sphinx at Delphi *c.* 560 indicating votive dedications made by the Naxians extended beyond Delos (see Fig. 4.86).[803]

[800] Boardman 2006b, 1.
[801] Fullerton 2016, 25; Boardman 2006b, 18-19; see Palagia 2006, 244, Fig. 78 on Greek modifications to Egyptian tools; The toothed chisel was not introduced until mid-6th c., see Kourayos, Daifa, Ohnesorg, and Papajanni 2012, 104; The earliest surviving Egyptian obelisk carved from red granite sourced near Aswan is at Heliopolis, dated to Sesostris I, 1918-1875. Obelisk construction was revived in the 26th Dyn, 664-525 which may have been observed by Greeks in Egypt. See Iverson 2013.
[802] Courbin 1980, Planche 1, 49 item 6; The height of the *kouros* is estimated from pieces found nearby.
[803] Boardman 1978, 20, 71, Figs 56, 100.

5 Unfinished kouros on the path from the quarries, Naxos

56 Kouros base from Delos. Ram, lion and gorgon head bosses. Signed 'Euthykartidas the Naxian made and dedicated me'. (Delos A 728; H. 0·58) About 600

Ἐυθυκαρτιδης :
μ'α[:]νεθεκε : ηο
Ναησιος : πο-
-ιεσας

***Figure 4.84 Top: Unfinished kouroi near Naxian marble quarries at Melanes. Suggests sculpture carving took place at or near to quarries and only finished or nearly finished pieces were shipped. From Boardman 1978, Fig. 55.***

***Figure 4.85 Bottom: Kouros base from Delos with inscription "Euthykartidas the Naxian made me", c. 600. From Boardman 1978, Fig. 56.***

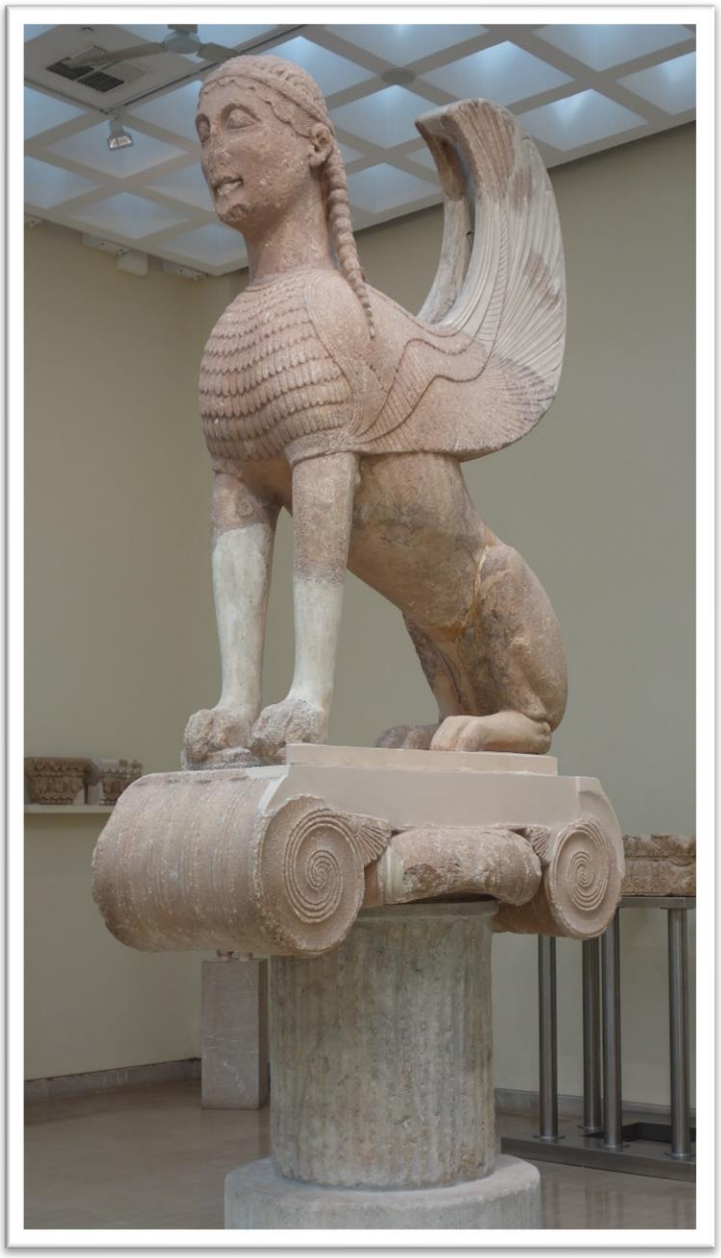


***Figure 4.86 Sphinx of Naxos dedicated at Delphi, c. 570 - 560. From Delphi Museum, item 380-1050.***

Monumental sculpture placed on top of 10 m tall Ionic column suggests sophisticated transport and lifting apparatus were utilized. See also Boardman 1978, Fig. 100.

The remains of marble statuary and the architectural contributions from Delos by the Naxians is voluminous in quantity and elegant in quality.[804] By any measure, these works are a demonstration of the creation of an enormous economic surplus by the Early Archaic period.

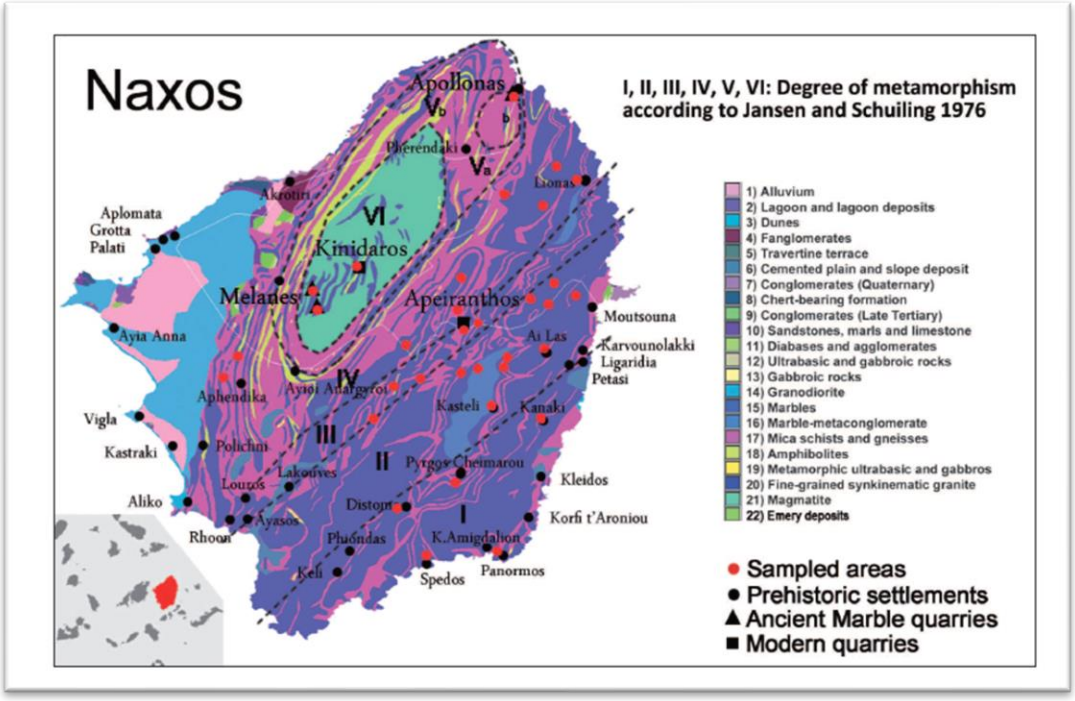



***Figure 4.87 Geological Map of Naxos showing location of Ancient Marble mines near Melanes and Emery deposits east of Apeiranthos. From Tambakopoulos and Maniatis 2012, Fig. 3.***

Naxos does not seem to have been solely dependent on mineral resources for wealth. Naxos had the most agricultural land area of any Cycladic island, almost 100 km², and with probably more rainfall by virtue of its high mountains catching weather systems, had probably the strongest agricultural economic base of the

[804] De Santerre 1958, 291-2.

archipelago. The Parian Archilochos remarked on being fond of Naxian wine saying it was like nectar, suggesting Naxian wine was exported.[805]

Compared to the wide distribution of ceramics from nearby Paros, Naxian pottery found outside of Naxos, is limited; found only in the surrounding Cyclades, Crete, and in Samos during the Geometric and Archaic periods.[806] Mainland Greek pottery imports are limited mostly to Attic and Euboean from the Late Protogeometric to Late Geometric. Attic imports were prevalent in the Late Helladic IIIC cemeteries of Aplomata and Kamini.[807] Cist grave eleven from Mitropolis, had two fine, wheel made Attic imports and a coarse, handmade Naxian jug.[808] Euboean pottery was recovered from Protogeometric grave 12 in Aplomata and in other burials in Plithos cemetery.[809] At Yria from the late 8th through the 7th century, Parian imports as well as local imitations of Parian pottery styles were common. Euboean imports become less common after 700. East Greek imports at Yria from Rhodes and Samos begin from the end of the 8th and continue into the 6th century.[810] Corinthian imports become common after *c.* 800. At Middle Geometric Tsikalario, a Cypriot import (or possible a Naxian imitation of a Cypriot type) mentioned above, was unearthed. There is debate as to whether this was an import, or an heirloom brought back to Naxos by a sailor involved in the Al Mina trade.[811] An intriguing example of diffusion are small terracotta birds, not commonly found in the Cyclades, yet twenty-six have been found on Naxos from burial contexts in Naxos Town and Tsikalario.[812] Other terracotta birds have been

[805] Ἀρχίλοχος τὸν Νάξιον τῷ νέκταρι παραβάλλει, LOEB *Archilochus Fragments* (LCL 259: 78-79, 2) quoted in Athenaeus, fr. 290.
[806] Charalambidou 2017, 377.
[807] Charalambidou, Kiriatzi, and Müller 2017, 111; Vlachopoulos 2008a; 2008b; Lemos 2002, 27 ff.
[808] Charalambidou 2017, 377, Figs 5a, 5b.
[809] Charalambidou, Kiriatzi, and Müller 2017, 110; Charalambidou 2017, 377.
[810] Simantoni-Bournia 2002, 278.
[811] Charalambidou 2017, 377.
[812] Charalambidou 2018; 2017.

found on Cyprus, Rhodes, Samos, Crete (from sanctuary of Hermes and Aphrodite at Syme Viannou), and in the Cyclades on Zagora in a trench south of the temple, at Siphnos on the northeast slope of Chora, and in Delos. The bird found at Zagora is possibly from Naxos.[813] The mix of pottery forms and motifs seen in imports from the 8th century argues for an expansion of interconnectedness, yet evidence of Naxian ceramic exports is scant.[814]

According to Thucydides (6.3), the earliest Greek colony on Sicily was founded in 734 by Chalcians from Euboea who named the colony Naxos. The colony has been interpreted by Lambrinoudakis as a joint venture between Chalcis and Naxos, with the Naxians providing the ships for transport and the name of the colony, while Chalcis was the mother city and provided the bulk of the settlers but there is no ancient authority for this.[815] Similar arrangements seem to have been made between Chalcis and Andros in forming colonies in the Chalcidice.[816] The site of Sicilian Naxos is the closest landing port available after sailing around the 'toe' of Italy.[817] Naxian pottery was found in early levels suggests Naxian involvement.[818] The site was clearly selected for trading like Pithekoussai, rather than for its mineral assets. Naxos is also associated with the founding of a colony on Amorgos at Arkesine.[819] An inscription related to the founding of a cult to Apollo at Arkesine referred to "The Assembly of Naxians living in Arkesine in Amorgos".[820]

[813] Charalambidou 2017, 384-6, Figs 11, 12.
[814] Charalambidou 2017, 383, 387-8; Charalambidou, Kiriatzi, and Müller 2017, 109-111; Coldstream 2009, 165-71; 1983, 18.
[815] Charalambidou 2017, 378 considered the association an 'affinity'; Lambrinoudakis 2004, 69.
[816] Boardman 1999a, 229; Reger 1997, 471.
[817] Boardman 1999a, 169-70.
[818] Lambrinoudakis 2004, 69.
[819] Bonnin 2015; Lambrinoudakis 2004, 69-70, n54; Stephan of Byzantium is the ancient authority (*Ethnika* 4028.001) 86; Reger 1997, 472. See discussion in Amorgos, Section 4.5.4.2.
[820] *IG* XII 7, No. 50.

As mentioned, Naxos may have been the location of the earliest coinage produced in Greece. Regardless of who was first, 6th century Naxian coins are the most prevalent Cycladic coins that have survived.[821] The large number of dies used and the variety of motifs, indicate this was an important regional coinage.[822] Sheedy suggests that larger coin issues between 520-500, indicate Naxian oligarchs in power after the Spartans deposed Lygdamis, had a greater appreciation for the commercial usage of coins.[823]

#### 4.3.3.4 Summary

It is thought that the Naxians may have had some form of control in the Cyclades during the tyranny of Lygdamis *c.* 530.[824] The literary evidence for this is thin; Diodorus copied a table from Eusebius's Chronicles that listed periods when various groups had control of the seas. One of the listed groups was the Naxians for a ten-year period.[825] Herodotus's stories of Lygdamis, Pisistratus, and Polycrates indicate some interesting dynamics occurred in the region as seen by the extortion at Siphnos and later, Aristagoras of Miletus bringing the Persians into the region. Herodotus (5.28) discussing events *c.* 500 wrote: τοῦτο μὲν γὰρ ἡ Νάξου εὐδαιμονίῃ τῶν νήσων προέφερε; For Naxos surpassed all other islands in prosperity. The extensive Naxian building projects on Delos would seem to support Herodotus's assessment. The Naxian economy may well have produced enough of a surplus to finance an expansive political program in the late 6th century.

Naxos is a unique island in the Cyclades because of its size and diversity of landscape. The strongest evidence in the Cyclades of continuity of population and cult activity from the Late Bronze Age through the Protogeometric and on into the

[821] See Cycladic hordes, *IGCH* 6, 7.
[822] Sheedy 2006a, 87-8.
[823] Sheedy 2006a, 92; when Lygdamis was deposed is controversial, see n819.
[824] Kourayos and Daifa 2017, 316, n 106, 107.
[825] Diod. Sic., 7.11 (LOEB LCL 340, 368-9). Which 10-year period is not specified.

Geometric period comes from Chora and its environs. The series of architectural structures and the pottery surrounding the Protogeometric burials at Grotta and the temple structures at Yria, provides evidence of social development from family and clan-based systems to the eventual *polis* system wherein power is voluntarily devolved to non-family members. As mentioned, additional evidence of this progression comes from Tenos and Amorgos. A fuller discussion follows the presentation of this material.

The expansion of agriculture to the interior in the late 9th century and the additive economic development of mineral resources is evident in the record. Naxos clearly pursued an additive economic approach with marble and emery quarrying, but the diversity of the economy must also be noted. The large agricultural area was exploited and provided continuity of economic activity.

Together with Paros, the two large central islands developed the strongest economies of the Cyclades. While one of the areas of inquiry in this thesis has been the development of additive economics, it must be remembered that Naxos and Paros were the two islands with the most arable land of the entire archipelago. Their agricultural base economy must have been foundational to the islanders' overall success. Given their buoyant economies, and proximity to one another, that friction and rivalry occurred should not be surprising.[826] Note though that the literary record of Naxian and Parian conflict describes incidents that occurred nearly two centuries later than when marble quarries were established on the two islands, arguably done with some social agreements on communal property rights.

[826] Kourayos 2018c, 280-1; Kourayos and Daifa 2017, 316-17 suggest Naxos controlled Paros very briefly *c.* 530; Kourayos, Angliker, Daifa, and Tully 2018, 147-8 suggests competition/disputes over Delos.

## 4.3.4 Donousa

### 4.3.4.1 Introduction

Compared to Paros and Naxos, Donousa is miniscule, only 13 km² with a high point of 383 m. The island's location though, 15 km off the northeast corner of Naxos, made it a vital cog in the east/west trade routes of the Iron Age.[827] There is no secure anchorage between Donousa and the eastern Aegean; To the northeast of Donousa, Ikaria is 45 km and Patmos 50 km, to the east Kos 110 km, and to the southeast Rhodes 225 km (see Fig. 4.88).[828] Sailing from the Levant to mainland Greece (as discussed in Chapter 3), one enters the Aegean between the northern tip of Rhodes and the southwest corner of Anatolia. From there, two options exist. The southern route is to sail around the bottom of Naxos and Paros, then up the western string of Siphnos, Seriphos, and Kythnos to the Saronic Gulf. In the southern route, the natural first port of call is Panormos Bay on Naxos and then on to Despotiko off southern Paros. The northern route is to work northward up the Ionian coast past Knidos to Kos or Samos, then sail west, across the prevailing north wind of summer, headed towards the north end of Naxos.[829] The first port of call on the northern route is Donousa, then on to either northern Naxos, Mykonos, or Tenos, then along the south coast of Andros to Euboea (see Fig. 3.18). Donousa is a key point of entry to the northern Cyclades for sail-powered craft moving from east to west. This holds true across all periods. Archaeological evidence on Donousa supports this analysis.[830]

[827] McGilchrist 2010(17), 148; Louyot 2008, 254.
[828] The small uninhabited islet of Levitha, 58 km east of Donousa and 45 km west of Kalymnos, has a temporary anchorage that the author has used with success; Strabo (10.5.12) mentioned Λέβινθος between Amorgos and Leros headed east from the Cyclades.
[829] Hdt. 5.33, Aristagoras in sailing from Ionia to attack Naxos worked north to Chios, then across, in order to use the north wind. ὡς ἐνθεῦτεν βορέῃ ἀνέμῳ ἐς τὴν Νάξον διαβάλοι. LOEB LCL 119, 34-35.
[830] Mazarakis Ainian 1997, 195, n1484.

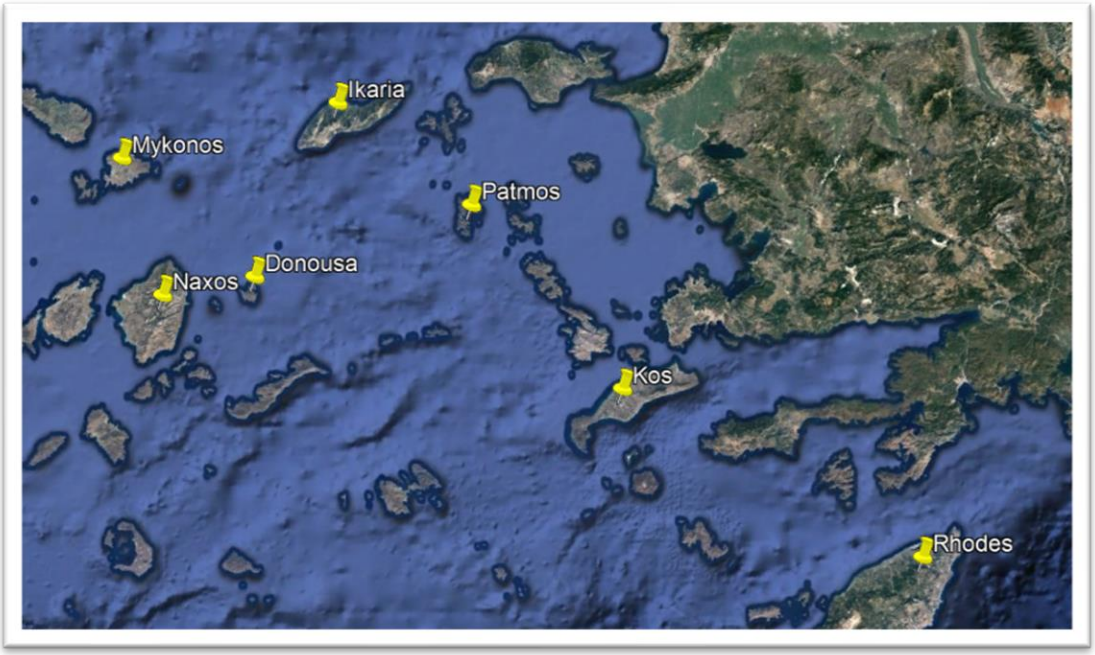



***Figure 4.88 Cyclades to Eastern Aegean. From Goggle Earth.***

### 4.3.4.2 History

On the south coast of Donousa, above an anchorage protected from the northern wind, is the Geometric settlement of Vathy Limenari. The settlement, sits on a peninsula projecting into the harbour, straddling a ridge about 30 m above the current sea level (see Fig. 4.89). A fortification wall protects the landward entrance to the settlement area, much like Zagora on Andros.[831] The site was excavated in the late 1960s by Zafeiropoulou and published in *Archaiologikon Deltion*.[832]

Pottery suggest the site was occupied during the Middle Geometric, from the 9th to the end of the 8th century. The earliest dated finds were crude Protogeometric designs with Eastern Greek affinities, especially with Rhodes and Kos, mostly large closed vases (amphorae, oinochoai, hydriai). Dated later were Middle Geometric

[831] Louyot 2008, 254.
[832] Zafeiropoulou 1969 *ADelt* 24, 390-3; 1970 *ADelt* 25, 426-30; 1971 *ADelt* 26, 465-7.

Atticized pieces *c.* 800, including a small krater.[833] Pottery was mixed in with shell and animal bones in two large pyres (7.0 m long, 60 cm thick) near an apsidal building on the cliff-top.[834] Similar pottery was found inside an adjacent building. The pottery was broken, but nearly complete.

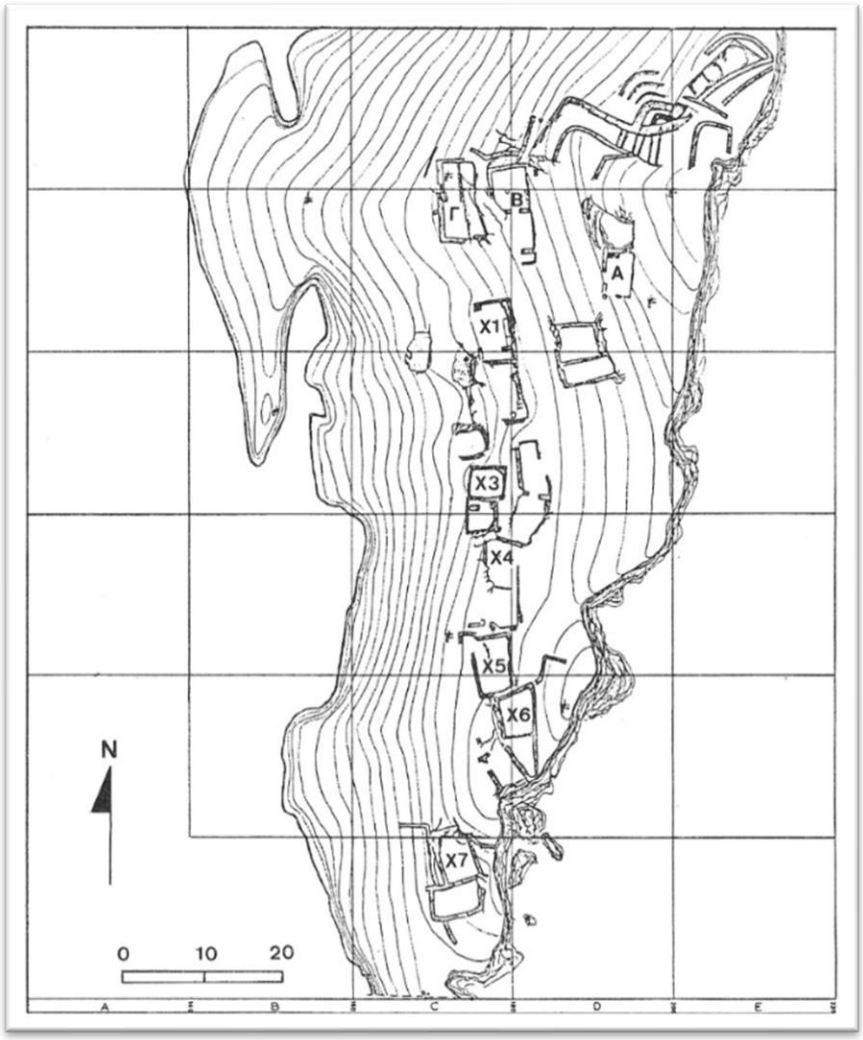



***Figure 4.89 Middle Geometric Settlement of Vathy Limenari. From Mazarakis Ainian 1997, Fig. 343.***

[833] Coldstream 2003, 91-2.
[834] Gounaris 2005, 30.

The fortification wall across the north of the peninsula was reinforced by a strong point (perhaps a tower) adjacent to the entrance. Three building phases of the wall have been identified, all dated within the Geometric period, with the first phase dated to *c.* 850 and the last to *c.* 750.[835] The settlement consisted of nine structures and other free-standing sections of wall. The houses are approximately the same size, 11.0 m by 4.5 m, typically with two rooms. Some have remains of hearths and benches.[836] The settlement size suggests that Vathy Limenari was not a trading-post as Zafeiropoulou proposed. The small population living in the nine buildings seems insufficient to have produced a tradable surplus, nor is there evidence of storage facilities for goods, indicative of a place of exchange. This suggests Vathy Limenari is better characterized as a stopping point with some support services available for transiting ships.[837]

At some point after the third phase construction of the fortification wall, the site appears to have been abandoned (speculatively, *c.* 700). Zafeiropoulou proposed the site was abandoned peacefully, but Fagerström noted burnt strata in several of the rooms, and Mazarakis Ainian suggests the almost complete but broken vases, indicates that perhaps people had to leave suddenly, taking just their valuable possessions.[838] Louyot proposed that Donousa was too small to support the requirements of a settlement large enough to compete in the evolving social climate of the Late Geometric, citing the synoecism of Hypsili and Zagora as an example of communities combining to be more suitably sized to support the needs of the inhabitants.[839] The settlement size suggests the goods and services capable of being provided by the inhabitants of Vathy Limenari were of secondary importance to Donousa's location as a secure shelter at the eastern entry to the

[835] Louyot 2008, 253-4.
[836] Mazarakis Ainian 1997, 194.
[837] Mazarakis Ainian 1997, 195, n1485.
[838] Fagerström 1988, 72; Mazarakis Ainian 1997, n1473.
[839] Louyot 2008, 255.

northern route through the Cyclades. An underwater survey of the south coast of Donousa is needed to determine if the anchorage continued to be utilized after the settlement's abandonment. Donousa was mentioned in sections 273, 281, and 284 of the Late Roman (perhaps 3rd century CE) *periplus* (sailing directions) *Anonymi Stadiasmus Maris Magni* as a stop between Delos or Naxos and Patmos suggesting its continued importance in Aegean sailing routes.[840]

[840] Text available from Topostext. Included in Müller's *Geographi Graeci Minores.*

## 4.4 Northern Tier

The islands of Andros and Tenos form a northern boundary to the Cyclades. The islands are separated by a narrow but navigable pass 1,000 m wide. Both islands are steep sloped on their northern shores while the downwind southern shores slope more gently to the sea. The southern coasts have several attractive harbours, unlike the northern shores.

### 4.4.1 Andros

#### 4.4.1.1 Introduction

Andros is the most north-westerly of the Cyclades, just east of the southern tip of Euboea (see Fig. 4.1). The *Steno Kafeiras* between Euboea and Andros, while only 11 km wide, is a significant navigational barrier to north-south travel.[841] The ends of the two islands are steep, funnelling the prevailing northerly winds between them causing wind to blow with considerable strength. According to Herodotus (8.13), this is where the Persian fleet was wrecked pursuing the Athenians after the battles at Artemisium. He referred to the area as 'the hollows', τὰ κοῖλα. The northerly wind creates a south flowing sea current which further impedes progress northbound. Passing east-west is not as significant a barrier. There are sheltered anchorages on the ends of both islands where sailing craft can wait. The Euboean city of Geraistos collected tariffs from vessels waiting to transit the strait.[842] The strait effectively separated the Aegean into northern and southern zones with the islands of Andros, Tenos, and Ikaria forming almost a wall delineating the boundary.

Andros is the second largest Cycladic island with an area of 383 km².[843] Relative to other Cycladic islands, it is fertile and wooded. The island is well watered with

[841] Heikell 2014; McGilchrist 2010, 624.
[842] McGilchrist 2010(9), 136.
[843] McGilchrist 2010(18), 55.

springs and streams and in antiquity was named Hydrousa (well-watered) in some accounts.[844] Rain clouds frequently build up on the northern side of the central mountain ridge dropping rain on the higher elevations (see Fig. 4.91). Iron mines and marble quarries are found in the north of the island.[845] Iron Age sites at Hypsili, Palaeopolis, and Zagora have been examined (see Fig. 4.90).


***Figure 4.90 Map of Andros. From Google Earth.***

[844] Palaiokrassa-Kopitsa 2007, 139; McGilchrist 2010, 100.
[845] McGilchrist 2010, 104-5.

***Figure 4.91 Clouds building over Andros in July, photo from north-western Tenos.***

#### 4.4.1.2 History

##### *Zagora*

Cambitoglou headed excavations at Zagora under the joint auspices of the Athens Archaeological Society and the University of Sydney in 1967, 1969, 1971, and 1974. A catalogue of finds was published by the Archaeological Museum of Andros and in excavation reports *Zagora 1* (1971)*, Zagora 2* (1988). In 2012, the Australian Archaeological Institute at Athens and the Archaeological Society of Athens under Beaumont and Miller resumed work at Zagora after a forty-year hiatus. The project is titled *Zagora Archaeological Project* (ZAP). Updates are available at www.powerhousemuseum.com/zagora/ which maintains a blog.

Zagora was established *c.* 925 based on finds of Late Protogeometric amphorae (335, 336) as well as a krateroid skyphoi (339, 340).[846] Several other skyphoi and cups (341, 342) post-date these earliest finds by *c.* 25 years.[847] The town was abandoned *c.* 700.[848] A sanctuary area separate from the town, but within the fortification wall, continued in use into the 5th century. There is no evidence of habitation prior to 925.

The site is on a high bluff surrounded by cliffs dropping precipitously to the sea on three sides, with a total area of about 7.5 ha (see Fig. 4.92).[849] The land approach was protected by a substantial defensive wall 140 m long and up to 7.25 m thick at the gate house.[850] The surrounding region is quite desolate with no fresh water source within the site and poor soil in the surrounding area for agriculture.[851] Springs outside the wall were fed by rainfall high on Andros that flowed through fractures in the schist and marble until the fractures intersected the surface and water appeared.[852] Excavators believe rain water was collected on flat roofs and stored in *pithoi*, several of which have been found at the site.[853] Building material is local schist of which there was no shortage. There is no secure anchorage convenient to the site, but two small coves may have been suitable for brief stops.[854]

[846] Pottery numbers from Cambitoglou 1981, catalog.
[847] Cambitoglou 1981, 84, 99, 121; Hall 2014, Fig. 4.1; Vink 1997, 121.
[848] Cambitoglou 1981, 20.
[849] Cambitoglou 1981, 19-23, 111.
[850] Cambitoglou 1981, 23, Figs 3, 5-7.
[851] Vink 1997, 120 described the site as "almost hostile to human occupation."
[852] Knight and Beaumont 2018, 59.
[853] Cambitoglou 1981, 39. Cambitoglou suggested that the Pithoi from Zagora and Xobourgo on neighboring Tenos look very similar with closely related abstract relief motifs including spirals, X-shaped hooks, fish tails, meanders, mythological figures, animals, and warriors with spears and shields; see Simantoni-Bournia 2004 on relief pithoi.
[854] Vink 1997, 120.

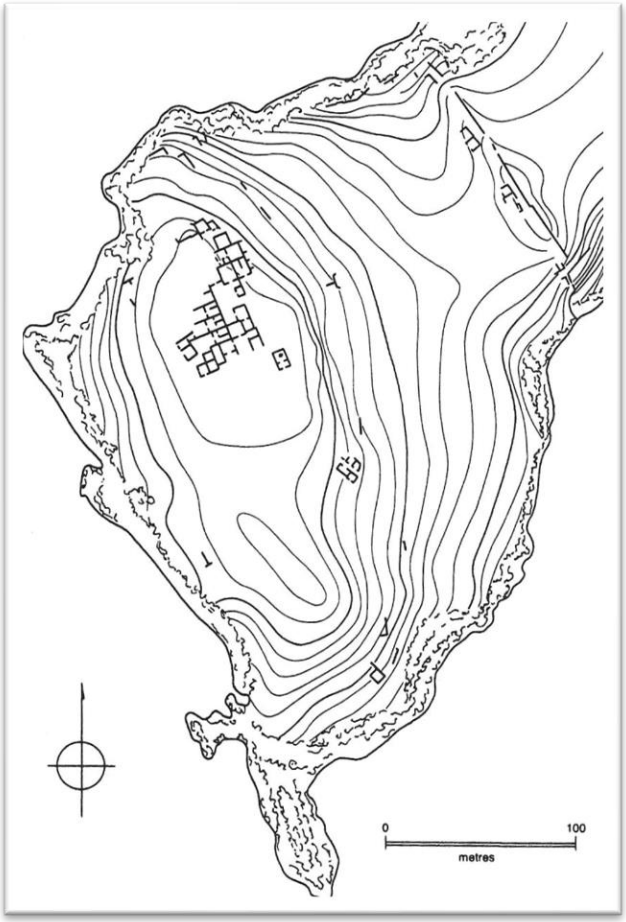



***Figure 4.92 Zagora on top of steep promontory surrounded be sea. From Snodgrass 1980, 30.***

The settlement comprised about twenty homes in one area, five or six in another and a third collection of buildings along the fortification wall. Iron slag was found near the buildings clustered at the fortification wall suggesting this may have been an artisanal area.[855] The houses were single room although in a later phase some partition walls may have been added.[856] One of the largest houses was H19 which

[855] Vink 1997, 126; Cambitoglou 1981, 20, 34, Figs 4,5,8-10.
[856] Vink 1997, 126.

opened onto a central area where votive offerings were found.[857] The ceramics were composed mostly of domestic shapes for food preparation and cooking (pithoi, skyphoi, kantharoi, stone pestles.) Fineware were nearly always painted and consisted of practical shapes for domestic use; cups, pouring, and mixing shapes.[858] Five Late Protogeometric fineware pieces suggested Euboean origin.[859] These were isolated cases found in a later context.

A cult area (Area IV) was separate from the dwellings.[860] A Geometric period open-air altar had poorly stratified, scanty remains around it. The open-air altar may have been augmented with a cult structure consisting of a rectangular room with a bench in the back and perhaps an apsidal porch. From the Geometric building area were found three iron knives, an iron spit, significant amounts of animal bones, especially from the cella area (274 fragments) consisting mostly of young pigs, and a few lambs. Young pig bones were rarely found in settlement areas; they seem to have been unique to the cult area.

Following the abandonment of Zagora, the Geometric sanctuary continued in use throughout the 7th century.[861] A grander Archaic cult structure was founded *c.*575 -550, dating based on ceramic evidence.[862] This building consisted of two rooms, a cella and a prodomos, was rectangular 10.42 m by 7.56 m, and built from local schist. Excavators suggest this second phase was built by citizens from Palaeopolis, the Classical city on Andros, returning to an ancestral site for worship. Pottery

[857] Mazarakis Ainian 1988, 109 suggested this large house may be that of a local ruler; Vink 1997, 127 and Cambitoglou *et al.* 1971, 45-8 and Cambitoglou *et al.* 1988, 79-88 interpreted H19 as a normal domestic dwelling in view of the similarity of the finds with other houses.
[858] Cambitoglou 1981, 35-7 for coarseware, 48-64 for fineware including numerous photographs.
[859] Cambitoglou 1981, 46-7. The Euboean pottery sequence has no EG or MG phase, PG carries through to LG. See Appendix A.
[860] Cambitoglou 1981, 82-4, catalog of finds from both phases 84-99, Fig. 11.
[861] Knight and Beaumont 2018, 68 concluded water supply issues prompted a gradual abandonment; Vink 1997, 120; Cambitoglou 1981, 84.
[862] Cambitoglou 1981, 84, drinking cups numbers 274, 275.

from this phase include black figure ware, an inscribed *lekane* and a cup base with ΗΡΑΚΛΕΟΣ inscribed on it.[863] This cult structure seems to have been in use until the later part of 5th century.[864]

Zagora's cemetery has not been excavated. Some cist graves have been opened by local farmers. The oldest vases found dated to *c.* 925 marking the earliest phase of Zagora.[865]

Euboean ceramics were common throughout the 8th century.[866] Strabo (10.1.10) mentioned that Andros, Tenos, Keos and other islands were ruled by Euboean Eretria [ἐπῆρχον δὲ καὶ Ἀνδρίων καὶ Τηνίων καὶ Κείων καὶ ἄλλων νήσων].[867] The nature of the relationship and the degree of political influence between Euboea and Zagora is unclear.[868]

### *Hypsili*

Excavations since 2003, primarily under the direction of Televantou, have revealed Protogeometric, Geometric, and Archaic period buildings. Hypsili is fifteen km north of Zagora on the western coast of Andros (see Figs 4.90, 4.93). The site is elevated on a plateau focused around an acropolis.[869] The acropolis is ringed by a

[863] Cambitoglou 1981, catalog numbers 280, 284,285.
[864] Gounaris 2005, 24-5, 29, 46, Tables A, B, C, examined Cycladic cult practices as theoretically predictive first steps for the development of the *polis.* At Zagora, he thought it significant that the urban and temple areas were separate from one another, yet both were incorporated within the overall civic plan behind the fortification wall.
[865] Cambitoglou 1981, 99, no. 335, 336.
[866] Kotsonas 2012, 249; Cambitoglou 1981, 111.
[867] ἐπῆρχον is the imperfect form of ἐπάρχω (ruled) implying continuous or repetitive past action.
[868] Kotsonas 2012, 247-8 in a discussion on how to distinguish between a Euboean colony and a trading station, noted the difficulty in relying on pottery as a criterion, 250 on ambiguity of relationship between Euboea and Zagora.
[869] McGilchrist 2010(18), 31.

fortification wall which enclosed an area of about 10 ha.. The settlement extended to the south and southeast outside the wall, covering another 5 ha..[870]

***Figure 4.93 Hypsili. From Televantou 2012, Plate 10.***

Hypsili was founded at end of the 10th or very early in the 9th century. Like Zagora, there is no evidence of prior habitation at the site.[871] The city flourished in the Late Geometric period. At the end of the Late Geometric period, the area outside the wall was deserted at about the same time Zagora was abandoned.[872] Evidence suggests a destruction occurred, perhaps caused by an earthquake.[873] In the subsequent 7th and 6th centuries, the settlement reverted to the space inside the fortification wall, presumably at a lower population level.[874] Hypsili was nearly

[870] Hall 2014, 74; Televantou 2012, 83.
[871] Televantou 2008a, 62.
[872] Hall 2014, 79; Televantou 2008a, 61; Palaiokrassa and Vivliodetis 2008, 139.
[873] Morgan 2012, 33, 40; Televantou 2008a, 62.
[874] Knight and Beaumont 2018, 68; Hall 2014, 79; Palaiokrassa and Vivliodetis 2008, 139.

abandoned by the early Classical period.[875] This may have been a result of the retributive Athenian expedition against Andros at the end of the Persian Wars (Hdt. 8.111-112).

The fortification wall had four main phases dated by Geometric to Archaic pottery.[876] The wall constructed from local schist, was first built in the early 9th century and followed the terrain's natural routing. It was strengthened at the exposed eastern section to a thickness of 7.10 m. Two towers (Tower B and a semi-circular extension south of Tower B) and three gates were incorporated at various phases.[877] Nineteen houses have been identified to the south of the fortification wall. Inside the wall several building phases are observable. The earliest dated to 925-850.[878] Houses were generally rectangular or irregular quadrangular shaped, with central hearths, benches, and with spaces for storage vessels. Houses both inside and outside the fortification wall clustered against the wall, often using the fortification as one of the house walls.[879]

A cleared area was preserved at the highest point inside the fortifications where cult activities took place. A sanctuary was built from local stone in the second half of the 8th century adjacent to the open space (see Fig. 4.94).[880] The sanctuary operated until *c.* 450, shortly after the final abandonment of Hypsili. The sanctuary has been associated with Demeter and eventually covered an area of about 450 m².[881] During the Late Geometric phase, the cult building was oriented on an east/west axis with an open pronaos and a cella. At the end of the 7th or early 6th century, the sanctuary was remodelled, and a new cult building was constructed

[875] Televantou 2012, 87; 2008a, 62.
[876] Archibald *AR* 2012-2013, 83-4; *AR ID* 3228; *AR ID* 3230; Televantou 2012, 83.
[877] Televantou 2012, 83-4; 2008, 63-5.
[878] Televantou 2008a, 65-6.
[879] Televantou 2012, 84.
[880] Mazarakis Ainian 1997, 328-9.
[881] Televantou 2012, 85-6; 2008, 67-8; Hall 2014, 79 associated the sanctuary with Athena.

that measured 7.15 m by 10.20 m enclosing the earlier Geometric building. Several rooms were built to the east and south as part of an expansion of the sanctuary. A purification took place at the end of the 6th century, in which 8th to 6th century offering items were removed from the cult centre and buried under clay plaster in corridor 18.[882]


***Figure 4.94 Hypsili naos and acropolis. From Televantou 2012, Plate 13.***

[882] Televantou 2012, 87; 2008, 68.

## *Palaeopolis*

The abandonments of Zagora and the area outside the fortification wall at Hypsili *c.* 700, contemporaneous with the founding of Ancient Andros, in an area today known as Palaeopolis, suggests the inhabitants of Zagora and Hypsili moved together in a synoecism.[883] The new site was a steep amphitheatre reaching down to the sea on the south coast of the island 10 km north of Zagora and 5 km south of Hypsili (see Fig. 4.95).[884] The city seems to have been built without a systematic plan.[885] The site continued to be occupied into the Byzantine period. Archaic levels are under substantial Hellenistic, Roman and Early Christian structures and deposits. Systematic ongoing excavations of the town began in 1987 under the direction of Palaiokrassa-Kopitsa by the University of Athens.[886] Significant portions of the site are privately owned consequently not open for excavation.

[883] Hall 2014, 79 discussed the synoecism of Zagora and Hypsili to form Palaeopolis as a certainty. A key feature for Hall was the continuity of the older sites as temples. During the Classical period on Rhodes the Archaic period cities of Lindus, Ialysos and Camirus appeared on the Athenian tribute lists as three separate entities. In 412 they all revolted from Athens and in 408/407 renounced their independence and formed a 'federal' state of Rhodes building a new city at the northern end of the island. The former cities continued as temple sites. See *OCD,* 4th ed., 1278; See also Morgan 2012, 29-30; Hall 2014, 40-60; Reger 1997, 469; Demand 1990.
[884] Palaiokrassa and Vivliodetis 2008, 140.
[885] Palaiokrassa-Kopitsa 2012, 23; both Hall 2014 and Gounaris 2005, n26, n35 support the synoecism interpretation.
[886] Palaiokrassa-Kopitsa 2012, 23; Frequent updates on recent activity appear in *AR ID.* See 5056 (2014), 4614 (2013), 2622 (2011), 2054 (2010), 5545 (2007), 5223 (2006), 3229 (2004), 533 (1999).

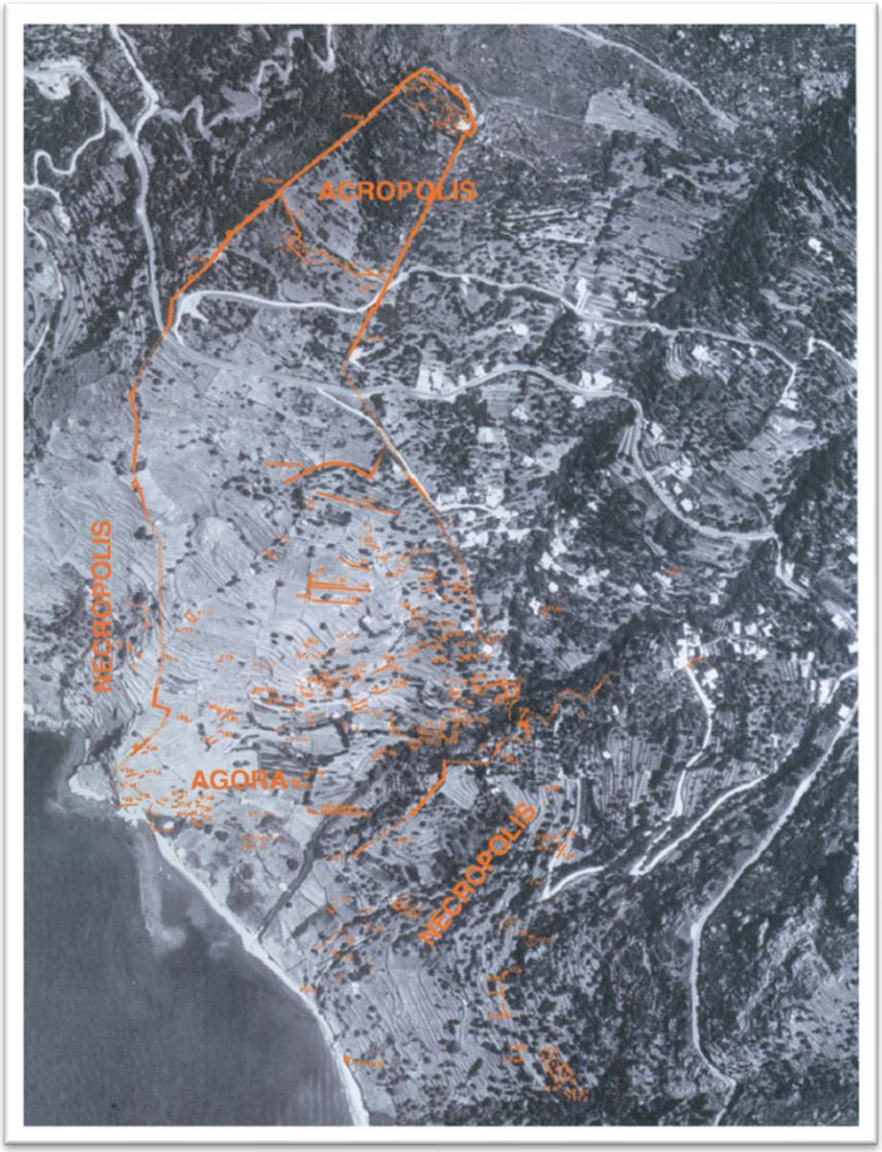



***Figure 4.95 Palaeopolis. From Palaiokrassa-Kopitsa 2012, Fig. 1.***

A substantial harbour area protected by moles was built (now submerged – see Fig. 4.95, lower left).[887] Underwater investigation of the submerged port area began in 2006 and is ongoing. The harbour is heavily silted.[888] The north mole extended 150 m, then turns and extends an additional 40 m.. The western

[887] Palaiokrassa-Kopitsa 2012, 32, this was the earliest phase of development.
[888] *AR ID* 5223.

fortification wall meets the northern mole. The intersection of the mole and the defensive wall was raised three times which indicated either sinking land or rising sea levels at the site. A substantial defensive wall was built surrounding the entire settlement. A necropolis existed outside the city wall to the southeast.

An agora was created on a relatively level area just behind the shore (see Fig. 4.96).[889] Ceramics date primarily from 3rd century BCE to 3rd century CE. Archaic coarseware finds were reported in 2014 and 2013 seasons.[890] In the Parasyri field, inside the wall on the eastern part of the site, a building with associated Archaic period ceramics was identified.[891] Fragments of *pithoi* adorned with propellers and palmettos dated to 7th century.[892]

[889] Palaiokrassa-Kopitsa 2012, 32, Figs 3, 4, 5.
[890] *AR ID* 5056, 4614.
[891] *AR ID* 533.
[892] *AR ID* 3229.

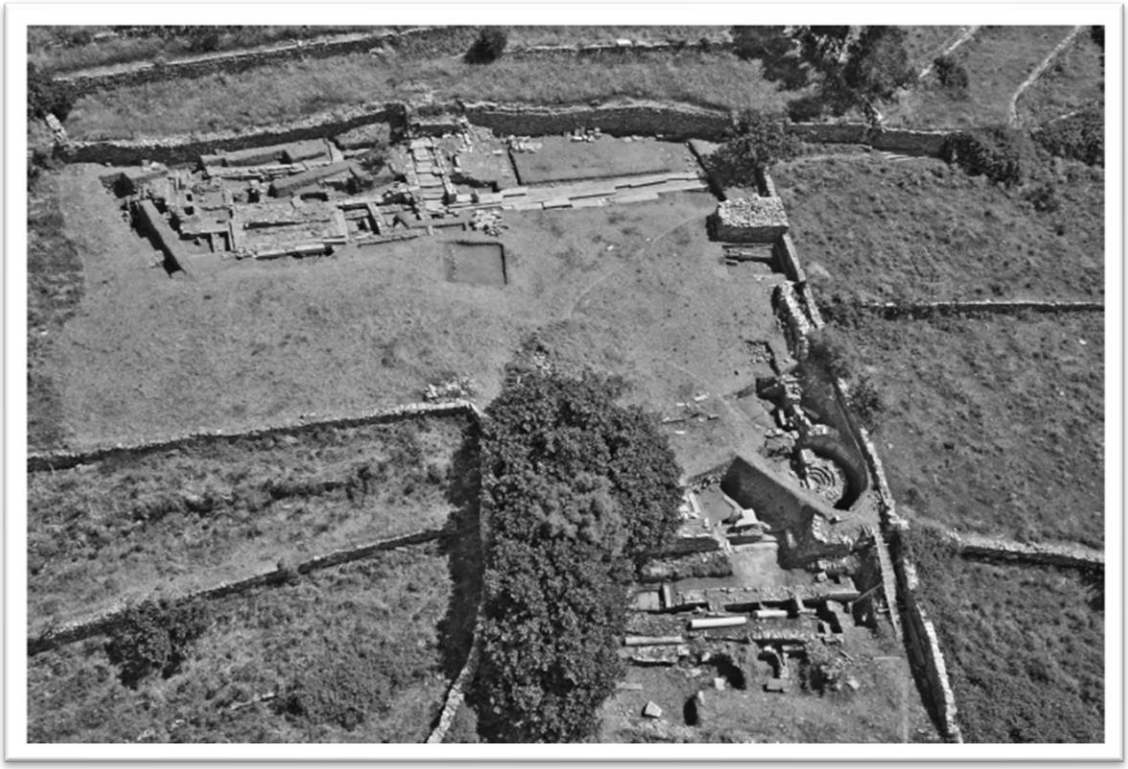


***Figure 4.96 Agora excavations. From Palaiokrassa-Kopitsa 2012, Fig. 2.***

Inland from the agora, frequent terraces were built to support the steep hill. Buildings tended to be located on the back of terraces, with paved roads connecting the terraces and well-constructed drains under roads and buildings.[893] Most of the extant structures post-date the Archaic period and it is unclear if the foundations of this system were Archaic. One road dated to the early Classical period.[894] There is an acropolis at the top of the site, 350 m above the harbour.[895]

### 4.4.1.3 Economy

Generally, people in the Cyclades moved at the end of the Geometric period from sites difficult to access from the sea to sites accessible by sea. Aristotle (*Pol.* 1.1.4-

[893] Palaiokrassa-Kopitsa 2012, 33.
[894] *AR ID* 4614.
[895] Palaiokrassa-Kopitsa 2012, 23.

11) described the merging of villages into a single larger settlement as the most common manner by which a *polis* was formed. On Andros, the simultaneous abandonment of Zagora and depopulation of Hypsili *c.* 700 appears to have been a voluntary decision by these groups.[896] Cult activity carried on at both sites afterwards.

There are several possible explanations for such a move. Zagora's nearest source of water was at least a fifteen-minute walk beyond the fortification wall whereas Palaeopolis was well watered.[897] Remains of a significant Hellenistic fountain house with settling tanks and a fountain head were uncovered at Palaeopolis in 2014.[898] Knight and Beaumont suggest that a climatological drying trend from 700 stressed the water supply at both Zagora and Hypsili may have prompted resettlement.[899]

Another possible consideration was access to trade routes. The northern route through the Cyclades, passed in front of Palaeopolis.[900] Arguably, the man-made moles created an attractive harbour. While Andrians did not develop their own design of transport amphorae, many trade amphorae coming from elsewhere have been found in Palaeopolis. An amphora dated to early 6th century recovered from the seabed, was inscribed ΝΙΚΕΑΣ in the Corinthian alphabet.[901] Transport amphora sherds originating in Thasos, Kos, and mainly Knidos, have been recovered from the agora. Most date from the 3rd century although some were 5th

[896] Hall 2014, 78-81, 85.
[897] Vink 1997, 120 there is no evidence of ancient water sources at Zagora, today there are some springs about a fifteen-minute walk from the site.
[898] *AR ID* 5056.
[899] Knight and Beaumont 2018, 64, 68; This is not universally agreed, Broodbank 2013, 506; Morris 2013, 66-7; Drake 2012, 1862; Sallares 2007, 19-20 support a wetter climate scheme scenario started *c.* 800.
[900] Kotsonas 2012, 250; Palaiokrassa and Vivliodetis 2008, 139.
[901] Palaiokrassa and Vivliodetis 2008, 143; Televantou 2002, 41-43, 68, cat. no. 30.

century.[902] Finds of millstones for processing cereals and olives, bronze fish hooks and lead sinkers, as well as clay fragments of beehives suggest elements of the domestic economy.[903] Large quantities of slag from smelting iron and copper ores have been found throughout the agora.[904] Fifth century coins from Argos, Athens, Delos, Ioulis on Keos, Paros, and Tenos have been found in the agora area. Andrians possibly produced coins from the later 6th century but the evidence is not certain.[905]

Andrians augmented trading commerce by founding colonies in areas rich in natural resources in the Chalcidice, often in collaboration with Euboean Chalcis. The Andrian colony Argilios founded on the coast of Thrace established mid-7th century was one of, if not the first, Greek colony in the region. Colonies in the Chalcidice were established at Akanthos, Sane, and Stageira.[906] Following the move to Palaeopolis, Archaic period Andrians developed a successful economy largely based on trade.[907] As discussed under trade routes in Chapter 3, Aristotle (*Oeconomica* 2.1-6) considered harbour taxes the second greatest revenue source for the state.[908] We do not have tax records from Andros to verify their specific situation, but the Andrians generated enough wealth that (equal second with Melos and Naxos) they trailed only Paros in the magnitude of the tribute paid to the Delian League in 425/424 (see Table 1).[909]

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[902] Palaiokrassa-Kopitsa 2012, 31; Palaiokrassa and Vivliodetis 2008, 143-7 catalogs amphorae finds.
[903] Palaiokrassa-Kopitsa 2012, 32.
[904] Palaiokrassa-Kopitsa 2012, 32, 34, the dating of the slag is uncertain.
[905] Palaiokrassa and Vivliodetis 2008, 141-2, n23; Sheedy 2006a, 24. There is no secure evidence for minting on Andros prior to 4th c., but there is debate that some coin issues assigned to Karthaia may have been Andrian.
[906] Thuc. 4.84, 4.88; Plut. *Mor. Quaest. Graec.* 30 (LOEB 298 A-B); Palaiokrassa and Vivliodetis 2008, 140; Boardman 1999a, 229.
[907] Palaiokrassa and Vivliodetis 2008, 139.
[908] See Rutishauser 2012, 51, 57, 61-2 on fee collection for harbor dues in the Cyclades.
[909] Palaiokrassa and Vivliodetis 2008, n20; Meiggs 1972, 242, 526, 530.

#### 4.4.1.4 Summary

The two towns of Zagora and Hypsili seem not to have had antecedents, suggesting a lack of continuity with the Late Bronze Age. They were arguably both built by newcomers.[910] The early finds of Euboean pottery, the later association with Chalcis founding colonies in Thrace, and ancient written accounts, suggests a connection with Euboea.[911] At the end of the Geometric period, the inhabitants of Zagora departed as did some of the population of Hypsili, and (probably) moved to form a single new town located on the sea, with a good harbour on a significant east-west trade route. This new site of Palaeopolis flourished. The building of significant harbour structures and the evidence of trade contacts suggests that a robust economy developed. The steep topography of the site and extensive later building in the Hellenistic and Roman periods replaced or obscured most of the Archaic period evidence limiting secure analysis of developments beyond trade. Evidence of iron ore mining and marble quarrying on Andros comes from later periods and cannot be dated to the Archaic period with confidence.[912]

### 4.4.2 Tenos

#### 4.4.2.1 Introduction

The geology of the Tenos and Andros is similar, consisting of a ridge of mica schist that forms the backbone of each.[913] Tenos has poorer quality soil than Andros creating a rather desolate aspect. Marble quarries located between Panormos and Isternia and near Marlas in the north were worked in modern times but there is no evidence of ancient quarrying activity. Settlement, both ancient and modern, is concentrated in the south-eastern end of the island (see Fig. 4.97). Total area is

[910] Televantou 2008a, 60.
[911] Televantou 2008a, 61.
[912] Palaiokrassa-Kopitsa 2012, 23; Televantou 2008a, 61.
[913] Sheedy 2006a, 74.

197 km², with a high point of 729 m. Andros and Tenos together form almost a continuous barrier across the top of the Cyclades, absorbing northernly winds and waves, giving protection to the rest of archipelago as a breakwater does to a harbour.


***Figure 4.97 Map of Tenos. From Google Earth.***

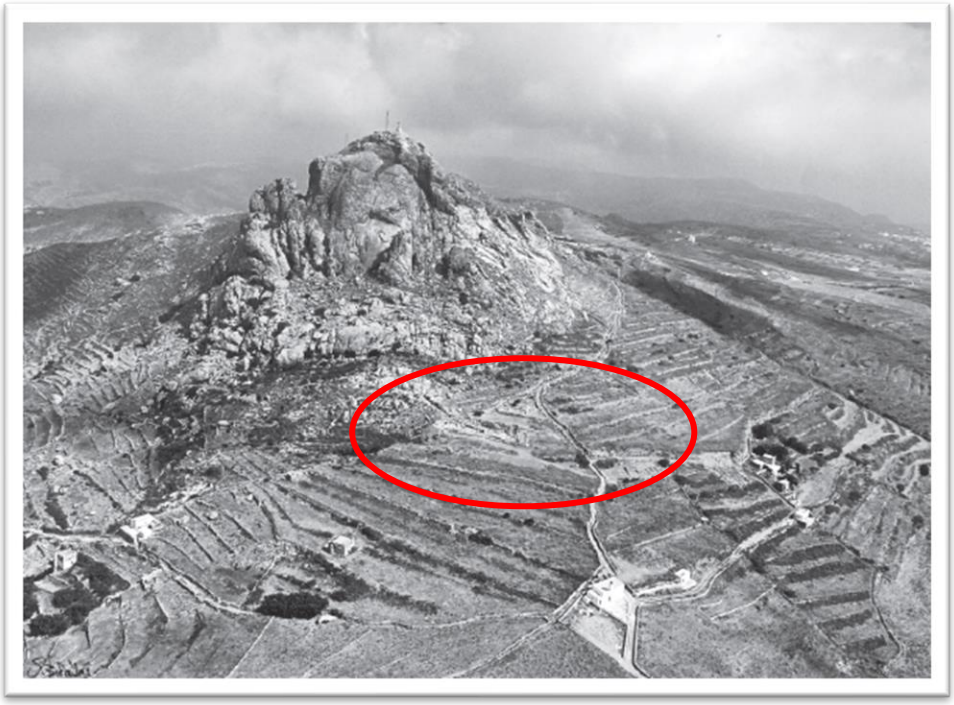

***Figure 4.98 Xobourgo from the south. From Kourou 2011, Fig. 1. Site area.***

### 4.4.2.2 History

Late Bronze Age material has been found at two sites, on the coastal, conical hill site of Vrykastro at the southeast corner of Tenos, and a single tholos tomb in the north of the island (see Figs 4.97, 4.99, 4.100)[914]. On the hill of Kardiani, eight cist graves have been excavated. Associated pottery dated to the Early Geometric period and included amphoriskoi with vertical handles, skyphoi with both full circles and semi-circle pendent designs, and glazed cups.[915] The Iron Age evidence comes principally from the inland site of Xobourgo. The timing of the abandonment of Vrykastro, and the founding of Xobourgo, plausibly suggests

[914] Author visited Vrykastro and notes abundant surface coarse-wear pottery with considerable mica content suggesting local fabric.
[915] Kourou 2004, 429-30; Coldstream 2003, 45, 91.

Xobourgo was founded as a refuge settlement by people moving away from coastal Vrykastro to a more defensive location (see Fig. 4.99).[916]

***Figure 4.99 From summit of Vrykastro looking towards distant Xobourgo.***

[916] Kourou 2011, 400.

***Figure 4.100 LBA surface finds from Vrykastro.***

Xobourgo sits at the foot of a rugged granite outcrop of rock, at an elevation of 557 m, five km from the coast (see Fig. 4.98). Adequate fertile land and good water supplies are down-slope from the settlement.[917] The site is built on a series of terraces defined by successive phases of fortification walls. The fortification walls protect the south front, west, and east sides of the settlement, tying into the mountainous outcrop behind and do not encircle the settlement (see Figs 4.98, 4.102, 4.112). Xobourgo was occupied continuously from the Protogeometric through the Classical periods. It was the only settlement on Tenos until the town of Tenos was formed at Aghios Nikolaos Bay in the 4th century.[918] Xobourgo was

[917] Kourou 2002, 255, Plate 65A.
[918] Kourou 2011, 399; Sheedy 2006a, 74.

visible from the sea approaches and not hidden from view such as Minoa on Amorgos was.[919] The timing of habitation and the site location being defensive but not hidden from view, are similar to both Hypsili and Zagora on neighbouring Andros.

Observable changes in masonry styles and associated pottery suggests a series of architectural phases. The earliest phase was wall A, of which 23 m are preserved (see Fig. 4.102). The inner and outer faces were constructed in Cyclopean masonry, with the internal space filled with rubble. The wall was founded directly on bedrock and is 2.9-3.0 m thick. Wall A formed an upper terrace that backed to the outcrop behind.[920] In the fortified area behind the wall, unstratified Late Bronze Age and Protogeometric sherds were found as well as evidence of metallurgy in the form of scattered slag and two stone moulds dated to Late Bronze Age (see Figs 4.107, 4.108).[921] Eighth and 7th century coarseware seems to have been produced on Tenos based on fabric similarities between cups, kraters, and pithoi.[922] Outside the settlement area, beyond the outer, downhill side of the wall, was a narrow terrace. On a section of this terrace, in an area about 150 m², 32 pyre pits and two cist graves were dug. Termed the Procyclopean sanctuary by Kourou, four phases dated from the 10th to 7th century are observable (see Figs 4.101, 4.111).[923] In phase one, individual pyre pits were cut into the bedrock. In phase two, the number of pyre pits increased, and some were enclosed into groups by low stone walls. An eschara and bench were added in phase three. In the fourth and final phase, a small *oikos* was built in the early 7th century.[924] Uncontextualized surface sherds, including finds from Attica and Euboea, dated to

[919] Kourou 2011, 400; 2002, 255.
[920] Kourou 2002, 256.
[921] Kourou 2002, 258.
[922] Gros 2015, 77.
[923] Kourou 2011, 400.
[924] Kourou 2011, 400.

Late Protogeometric suggesting a tenuous foundation date for the sanctuary. Late Geometric and early 7th century finds mark the end of the sanctuary's use. A Late Archaic wall (AA) buried many of the pyre pits, suggesting that the Procyclopean sanctuary had been out of use by the time the new wall was built.[925]


***Figure 4.101 Plan of Procyclopean sanctuary with overlying Archaic wall AA. From Kourou 2011, Fig. 2.***

[925] Kourou 2011, 401; 2002, 258.

***Figure 4.102 Cyclopean wall section at western end of fortification wall.***

An examination of diachronic changes to the pyre pits, suggests a progression of social stages from family units, to larger clan units, to a *polis* structure occurred at Xobourgo similar to what was observed at Grotta on Naxos.[926] The phase one and two pits averaged about 60 cm diameter and were marked with a roughly worked stone, though some had a smooth stone that served as an offering table. Judging from offerings found on them and traces of organic material, suggest libations were offered. Inside the pits, were ashes containing animal bones, pottery (including Attic), loom weights, and some bone rings (see Fig. 4.103). All items had been thrown into a fire. The fire was then extinguished by tossing stones on the fire until a small tumulus built up. On top of the tumulus, a single black or white

[926] See Kourou 2015; 2011, 405 for parallels with Naxian Grotta, Tsikalario, Sangri and Melanes especially regarding pyre pits and pebble platforms; Reger 2004, 778 lists Xobourgo as the *polis* of Tenos from the Archaic period onwards.

pebble brought up from the sea was placed (one white and one black when pits were arranged in pairs).[927] Dated to the Late Geometric period, one pit had a partially preserved pebble floor built over a pit that had been emptied and then filled with pure beach sand (coast was 5 km and 540 m of elevation distant).[928] The offering tables, pebble floor built over earlier graves, and the pure ocean sand filling in a grave, match the architecture observed at Grotta and have parallels to the pebble platforms built over graves found at Lefkandi on Euboea.[929] Late Geometric phase three was marked by the building of a large eschara at the centre of the terrace with the construction of a large bench opposite (see Figs 4.104, 4.111). The pyre pits in the area around the eschara were sealed and paved over with large schist slabs (other pits on the terrace remained in use). Kourou suggests the eschara implies a broader, communal ceremony of sacrifice that served larger gatherings than a family or clan unit.[930] Phase four in the early 7th century, was marked by the building of a small *oikos* measuring 4.8 m by 4.8 m over the pyre pits in Enclosure III (see Figs 4.105, 4.111). Entrance to the *oikos* was on the east side through a wide door with a one-piece threshold (like the entrance to the contemporary cult building dedicated to Athena at Koukounaries on Paros). Finds from the *oikos* include two pithoi set on large stone bases (see Fig 4.109), figurines (dated early 7th century), and pieces of a terracotta frieze depicting a procession of chariots pulled by winged horses led by a female figure wearing a high polos.[931] The size and rich decorations of the *oikos* suggests to the excavators that it was financed by the community of a mature *polis.*[932]

[927] Kourou 2015, 99, Figs 13, 14; 2011, 401.
[928] Kourou 2015, 96-8, Fig. 12; 2011, 402.
[929] Kourou 2015, 92-99.
[930] Kourou 2015, 98-9, Fig. 15; 2011, 402-3.
[931] Kourou 2015, 99-100, Figs 15, 16; 2011, 403; Simantoni-Bournia 2004, Plate 36.
[932] Kourou 2011, 404.

***Figure 4.103 Twin and double pyre pits. From Kourou 2011, Fig. 3.***


***Figure 4.104 Eschara and bench. From Kourou 2011, Fig. 6.***


***Figure 4.105 Oikos and bench from Procyclopean sanctuary. From Kourou 2011, Fig. 7.***

Two-hundred m east of the Procyclopean sanctuary, another eschara and an associated Pi (Π)-shaped altar, were built in the area of the later Thesmophoria (see Figs 4.106, 4.112).[933] Several pieces of graffiti have been found in association with this eschara. Those marked with ΠΟ or ΠΟΛ are thought to mean ΠΟΛΕΟΣ, "of the *polis*." Those marked ΔΗ are interpreted as ΔΗΜΟΣΙΟΝ, "of the

[933] The term Thesmophoria for these buildings is controversial. The architecture and the nature of finds including relief pithoi suggest it was a public building with a religious character. See Kourou 2011, 404; Gounaris 2005, 46, 49 noted the relief pithoi are the securest evidence for dating the first phase; Simantoni-Bournia 2004, 78-80, 89-91.

community."[934] The buildings of the Thesmophoria date to the Classical period but appear to have repeated the plan of an earlier Geometric complex. The Geometric eschara is the same form, size, and built with the same construction technique as the eschara from the Procyclopean sanctuary. Moreover, situated in a corridor of the later Classical Thesmophoria, suggests it had not been part of the later building's plan. Relief pithoi dated to the Late Geometric and Early Archaic periods were found in the complex, all other pottery dated to the Classical period (see Fig. 4.110).[935]

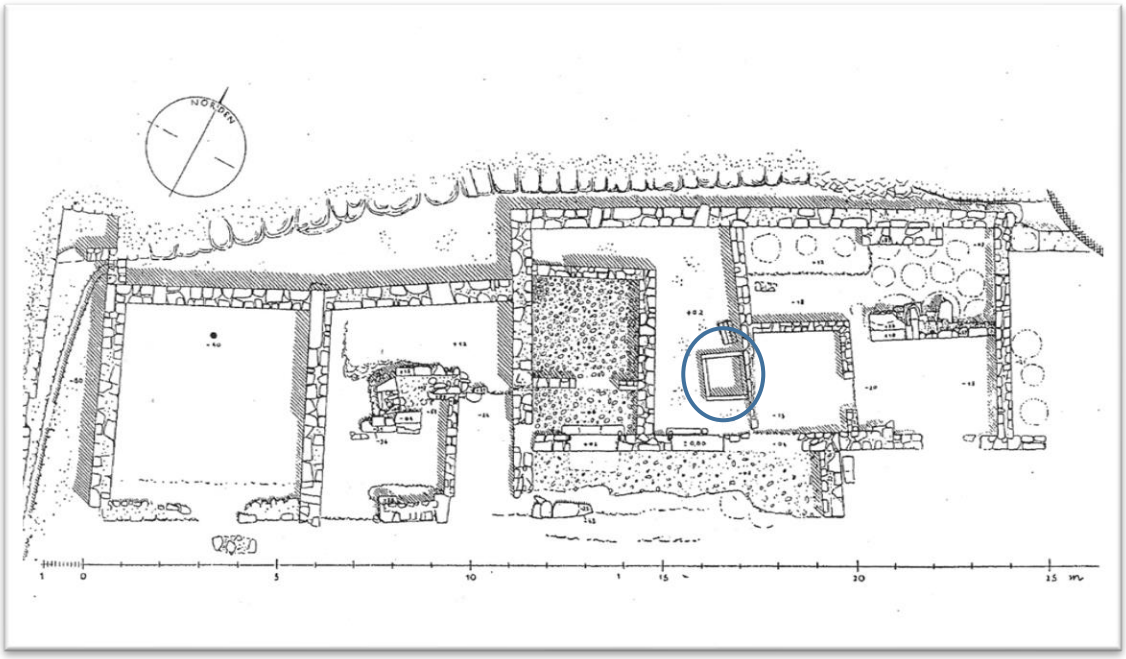


***Figure 4.106 Buildings of Thesmophoria. From Simantoni-Bournia 2004, Pl. 19.***

Eschara circled by author.

[934] Kourou 2011, 404; 2002, Plate 68B.
[935] Kourou 2011, 404; 2002 262-5; Simantoni-Bournia 1999.

***Figure 4.107 PG and EG pottery from Xobourgo. Tinos Archaeological Museum.***

***Figure 4.108 PG and EG pottery from Xobourgo. Tinos Archaeological Museum.***

***Figure 4.109 Relief amphora from Oikos, 7th c.. From Tinos Archaeological Museum.***

***Figure 4.110 Relied Pithos from Thesmophoria. Tinos Archaeological Museum.***

In the Archaic period, wall AA was built in front of wall A across the Procyclopean sanctuary burying many of the pyre pits beneath it (see Figs 4.101, 4.111).[936] Construction of this wall marked a new phase to the settlement of Xobourgo. Wall AA extended further east than the old wall protecting houses built to the east. The new wall is dated by mid-6th century pottery, a Delian stater, and graffiti on pot sherds found in association. This wall has evidence of several extensive repairs suggesting it was kept in use for the duration of the site's occupation. Herodotus (6.97) recorded the inhabitants of Delos sought refuge at Tenos during the Persian Wars, suggesting Xobourgo was the closest, most secure aspect available in the early 5th century.[937]

***Figure 4.111 Xobourgo with Wall AA built over older Eschara (right) and Oikos (left).***

[936] Kourou 2002, Fig. 4.
[937] Hdt 6.97: ἐκλιπόντες καὶ αὐτοὶ τὴν Δῆλον οἴχοντο φεύγοντες ἐς Τῆνον.

On terrace E, near the entrance gate through Cyclopean wall A, are the remains of building E in a commanding position over the Archaic phase of the site.[938] The building's function is unclear but its large size, fine decoration, spacious rooms with large pithoi, and position in the settlement suggest it was something other than a private house. Bronze allotment plates and some lead weights found in it suggest a public, administrative function.

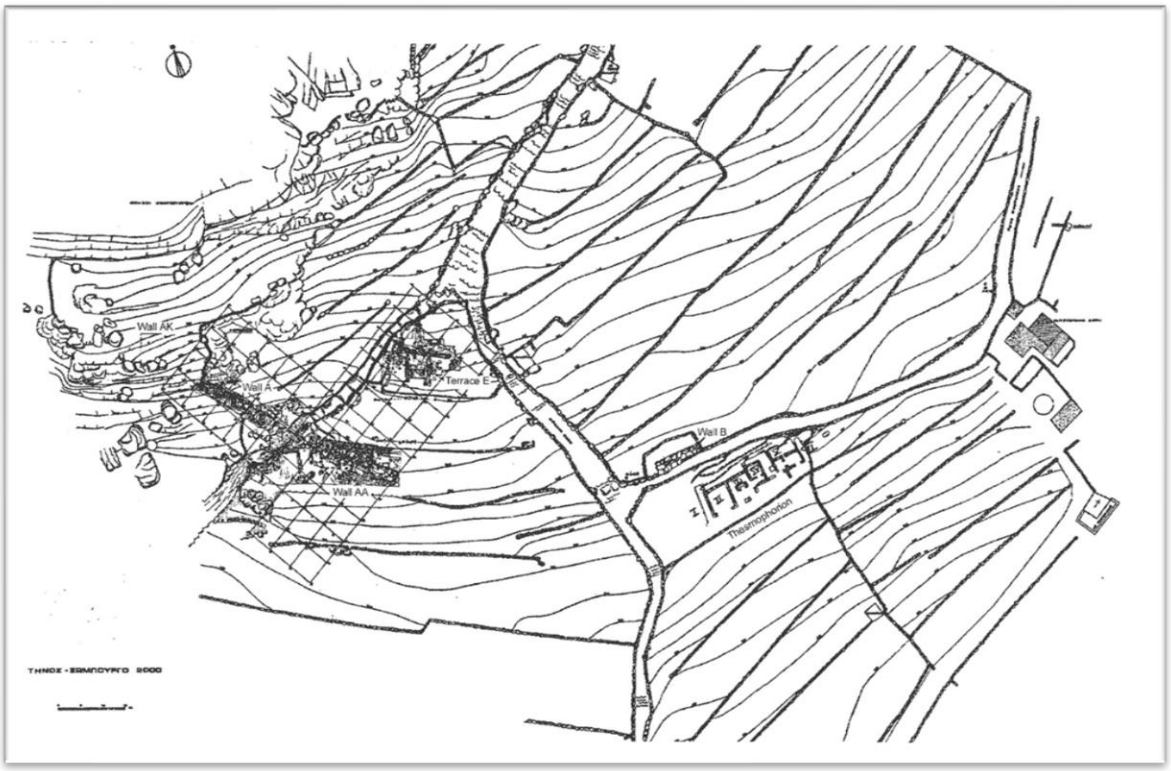


***Figure 4.112 Site Plan of Xobourgo. From Kourou 2002, Fig. 1.***

According to Herodotus (8.66), the Tenians supplied ships to the Persian fleet at Salamis which implies they had some sort of coastal/maritime presence and did not just reside inland. One ship famously defected to the Greeks which earned the Tenians recognition on the serpent column dedicated at Delphi in

[938] Kourou 2002, 267, Fig. 6, Plate 67D.

commemoration of the allied Greek victory over the Persians.[939] Tenos may have been an original member of the Delian League and appears in the tribute lists twelve times, at first paying three talents, later reduced to two.[940]

At some point in the 4th century, either before or as part of a large civic reform, the citizens of Tenos were divided into ten territorial *phylai* (attested from a register of land sales), and the main settlement moved to a coastal location on the shore of Aghios Nikolaos Bay.[941] This became the primary *polis* of Tenos and continues as the main modern town on Tenos (see Fig. 4.97). Extant sections of a fortification wall and a tower surround an area of nearly 7 ha, delineating the unexcavated Acropolis (see Figs 4.113, 4.114).[942] One of the tribes was referred to as ἐκπολεώς meaning those from the former *polis* of Xobourgo. Toponyms associated with the names of the *phylai* suggest that the population was more dispersed around the island.[943] Three km northwest of the new capital, a sanctuary to Poseidon and Demeter was established, also in the 4th century. Writing in the Augustan period, Strabo (10.5.11) noted that Tenos had no large city and that the sanctuary was considered more important.[944] A coin from a hoard dated 525-500 found in Rhodes, had a grape cluster motif on the obverse. Some have suggested this one coin may be evidence of Archaic minting on Tenos as Hellenistic period minted coins from Tenos had grape clusters on them.[945] Sheedy suggested that there is little evidence for coin minting in the northern Cyclades before the 4th

[939] Hdt., 8.82; Meiggs and Lewis 1988, 27.7.
[940] Reger 2004, 777.
[941] Reger 2004, 777; Étienne 1990, 15-24, 45-7; *IG* XII.5 872.
[942] Above modern Tinos town. Walked by author, area inside the wall has not been excavated or explored. The fortification wall encloses an area of about 7 ha.
[943] Reger 2004, 777; Étienne 1990, 24-30, the specific locations are debated.
[944] Strabo 10.5.11, Τῆνος δὲ πόλιν μὲν οὐ μεγάλην ἔχει, τὸ δ᾽ ἱερὸν τοῦ Ποσειδῶνος μέγα ἐν ἄλσει τῆς πόλεως ἔξω, θέας ἄξιον·.
[945] Reger 2004, 778.

century. The iconographic evidence from this one coin seems insufficient to establish that minting occurred on Tenos before the Hellenistic period.[946]

***Figure 4.113 Tower of unexcavated acropolis wall.***

[946] Sheedy 2006a, 72-4.

***Figure 4.114 Wall section on westside of unexcavated acropolis.***

### 4.4.2.3 Summary

Xobourgo is noteworthy for its length of habitation, extending possibly from the end of the Late Bronze Age through to the Classical period. Cult activity at Xobourgo cannot be demonstrated before the Late Protogeometric, but habitation seems possible as evidenced by pottery inside the Cyclopean wall. The social progression of authority vested in the family unit, to the larger clan structure during the Geometric period, culminating by the Late Geometric in devolved authority to a *polis* structure in the Early Archaic seems evident. The similarities of burial practices and their evolution is strikingly similar in the social progression from family units to the *polis* that can be observed on Naxos.[947] But there are significant differences too. On Naxos, worship of a much earlier Bronze Age ancestor cult can be observed whereas at Xobourgo, since it was likely founded as

[947] Kourou 2015, 83.

a refuge site at the very end of the Bronze Age, distant ancestor veneration is less plausible. At Xobourgo, a continuous restructuring of the Cyclopean sanctuary to adapt to the social developments that occurred seems to underly the observed changes in cult architecture.[948]

There is no evidence of additive economic activity at Xobourgo. Tenos did have marble resources in the north that went unexploited in antiquity. The island, just like Andros, was on the Euboean – eastern Aegean and Levantine trade route, yet the main settlement remained fixed at inland Xobourgo, five km distant from the coast. The inhabitants did not develop harbour facilities to take advantage of the island's location until the foundation of the town of Tenos on the coast in the 4th century. Geometric and Archaic period evidence of outside contact is limited. Pottery attributed to Attica and Euboea were found only in the earliest levels and in some of the pyre pits.

It is difficult to reconcile the ten talents of *phoros* charged to the Tenians in 425/424 with the small excavated area of Xobourgo. It suggests there was economic activity elsewhere on the island that is archaeologically unattested.[949] As an example, no seaside presence is archaeologically attested, yet the Tenians supplied multiple triremes at Salamis. A previously unknown Classical necropolis at Vardalakos east of Xobourgo is currently under investigation. Underneath the floor of a 4th century building a series of pits were found related to a metallurgical workshop.[950] Perhaps there had been economic activity in the large unexamined area within the later *polis's* fortification wall that could support such a high *phoros*.

[948] Kourou 2015, 101.
[949] Sweetman 2016, 53-5 had a similar observation that the archaeological remains of Roman Tenos do not support the epigraphic evidence of an island doing well.
[950] *AR* 2017-2018, 42-3, Fig. 41; *AR ID* 5054, 4220.

This all suggests that there is much to learn still about Tenos's economic capabilities.

The evident isolation of Tenos suggests that, in addition to having exploitable resources, be they mineral or locative, what is also needed is a desire to exploit those resources. A conscious decision taken either individually or collectively, to undertake the investments necessary to develop additive economic activities must occur. Based on the evidence we have; these types of decisions seem not to have manifested themselves on Tenos prior to the end of the Classical period. This discussion is developed further in Chapter 5.

### 4.4.3 Mykonos

Mykonos is 8.65 km southeast of Tenos and just under 3 km northeast of Delos. It is between 25 and 30 km from the north ends of Paros and Naxos (see Fig. 4.1). The island is 86.6 km in area and is one of the flatter Cycladic islands with a high point of 373 m. Among the larger islands, only Kythnos is lower. Arable land area is 18%. There are good harbours protected from the north and protected from the south, but no all-weather anchorage.

Literary evidence suggests that there were two *poleis* on Mykonos. Pseudo Skylax in the 4th century described Mykonos as δίπολις, and a mid-3rd century inscription referred to when the two *poleis* merged in a synoecism.[951] The suspicion is that the modern town of Mykonos is on top of one ancient settlement and that a second polis was at Palaeokastro, southeast of Panormos Bay.[952] Without the literary references to two *poleis* we would likely assume that there had been one

[951] Reger 1997, 452, n10; Ps. Skylax 58 (*GGM* I, p. 47); 3rd c. inscription: ὅτε συνωικίσθησαν αἱ πόλεις. (*Syll.*³ 1024.3).
[952] McGilchrist 2010(4), 9-10, 26.

*polis* in ancient Mykonos, probably centred around the small hill west of the old port in Mykonos town (where the Venetian Kastro was).[953] However, there is no archaeological attestation of an Iron Age presence at either location to verify the literary evidence of two settlements.[954] Consequently there is little evidence to consider in a study of Mykonos with the exception of a 7th century relief pithos used in a child's burial (see Fig. 4.115).[955] This was recovered in 1961 while digging a well in Mykonos town. The pithos is 4.1 m tall with iconography of the sack of Troy and is stylistically and chronologically like relief pithoi from nearby Tenos.

[953] McGilchrist 2010(4), 13; Reger 1997, 476.
[954] Reger 2004, 760.
[955] Ervin 1963, 38-9. There were no grave goods found in association.

***Figure 4.115 Relief Pithos from Mykonos. Mykonos Archaeological Museum.***

Mykonos appeared in the Delian League tribute lists thirteen times between 452/451 and 416/415. The Mykonians were assessed a *phoros* of 1.5 talents in 452/451 reduced to 1 talent the following year. In the high assessment of 425/424, it was increased to 2 talents.[956]

The Mykonians did not have the best reputation. A fragment of Archilochos was preserved in a passage of Athenaeus's *Deipnosophistae* (1.7f-8b) where Archilochus spoke of Pericles bursting into dinner parties uninvited like the people of Mykonos (Μυκονίων δίκην). Athenaeus related that the people of Mykonos had a poor reputation for stinginess and greed due to living on a poor wretched island.[957]

Speculatively, Mykonos's greatest asset was probably its location proximate to Delos. It would have attracted commerce enroute to and from the Sanctuary. The Mykonians probably did not have restrictions such as prohibitions on birth and death that Delos had, making it perhaps a more suitable place for habitation in the Archaic and early Classical periods but archaeological attestation in support of this is lacking.

### 4.4.4 Delos

The sanctuaries at both Delos and Delphi formed on the outskirts of small villages.[958] As sanctuaries, they did not follow the progression of development seen in settlements. On Delos, the small Late Bronze Age settlement seems to have been abandoned in Late Helladic IIIB as Late Helladic IIIC evidence is not

[956] Reger 2004, 760.
[957] See LOEB *Greek Iambic Poetry,* Archilochus 124. δοκοῦσι δ' οἱ Μυκονίων διὰ τὸ πένεσθαι καὶ λυπρὰν νῆσον οἰκεῖν ἐπὶ γλισχρότητι καὶ πλεονεξίᾳ διαβάλλεσθαι…; Athenaeus's placement of Archilochos and Pericles as contemporaries is unexplained.
[958] Malkin 2011, 78.

extant. This is earlier than the Late Helladic IIIC abandonments seen elsewhere such as Ayia Irini on Keos, Phylakopi on Melos, and Aghios Andreas on Siphnos. Habitation on Delos is not seen again until late in the 9th century.[959] By the Late Geometric period, the sanctuary had grown in importance evidenced by the construction of the Pre-*oikos* of the Naxians, the Temple of Artemis, and the small chapel to Hera on Mt. Kythnos, all constructed *c.* 700 or slightly later (Temple Gamma may predate these structures).[960] Delos was the recipient of dedications and offerings. Consequently, the island's relevance to this examination is to observe when others were able to generate the excess wealth to enable them to make dedications. Delos was a benefactor of the increasing economic output of other Cycladic islands (and elsewhere) rather than a creator of that wealth. Therefore, it seems logical to place the discussion of dedications made at Delos in the sections of the dedicands rather than in a section on Delos.

[959] Mazarakis Ainian 1997, 329.
[960] Mazarakis Ainian 1997, 179-83, 329; See discussion above in Naxos Section 4.3.3.3.

## 4.5 Southern Tier

As discussed, ancient writers thought the southern islands Doric, linked etymologically and perhaps by cult practices.[961] Melos and Thera were considered Spartan colonies (Hdt. 4.147, 8.48; Thuc. 5.84; Strabo 10.5.1). However, currency issued by Melos was based on the Milesian stater whereas Thera used the Aeginetan standard suggesting there may have been divergent associations.[962] Melos and Kimolos were included in the western group based on shared geomorphology with the western islands but could have logically been included here. The islands grouped in this section were based on geography, they form the southern border to the Cyclades.

### 4.5.1 Thera

#### 4.5.1.1 Introduction

Striking in appearance, Thera and Therasia collectively form about 70% of the rim of a caldera, the result of volcanic explosions and implosions which both blew away and sank the centre of the island (see Fig 4.116). The rim of islands collectively forms an area of 76 km², of which 54% is arable, the highest percentage in the Cyclades. The eastern part of the rim has a width of about five km. Mt. Prophitis Elias rises to a height of 567 m. Earthquake and volcanic activity of great severity is evident in both the geological and historical record. Thera is the closest Cycladic island to Crete, about 115 km distant, and has more evidence of contact with Crete in both the Bronze and Iron Ages than the other islands do.[963]

[961] Craik 1980, 4-6, 168-9.
[962] Sheedy 2006a, 59, 66-7.
[963] Sheedy 2006a, 60-1.


***Figure 4.116 Thera and Therasia. From Google Earth.***

### 4.5.1.2 History

Thera was uninhabited after the Late Bronze Age eruption which buried the city of Akrotiri *c.* 1620 by one estimate and 1550 by another.[964] Evidence of resettlement is first attested through burial evidence in the late 9th or possibly early 8th century.[965] Ancient Thera at Mesavouno is the only securely dated Iron Age site.

[964] Driessen 2019, 196 discusses scientific and archaeological dating methods; Friedrich and Heinemeier 2009, 59 and Heinemeier, Friedrich, Kromer, and Ramsey 2009, based on radiocarbon and dendrochronology dated the eruption to 1613 +/- 13 years; New evidence published 19 March 2020 calibrated Carbon-14 data with Mediterranean tree rings (as opposed to northern European tree ring data) suggest 1550 as the more appropriate date, see Manning, et al. 2020; MacGillivray 2009 presented the archaeological evidence for dating the eruption.
[965] Palyvou 2015, 125; Sperling 1974, 324; Zafeiropoulou 1971, 226-30.

Additional settlements may have been at Oia and Skaros, but these are not archaeologically attested.[966] Unstratified surface pottery sherds dating to Archaic and Classical periods have been found across the island. Looted material from ancient cemeteries has been sold on the art markets (see Fig. 4.117).[967] Even the exact provenance of the *kouros* Apollo of Thera (now in Athens Archaeological Museum) is uncertain.[968] Herodotus (4.153) described Thera as divided into seven districts but there is no record of what the districts were.[969]

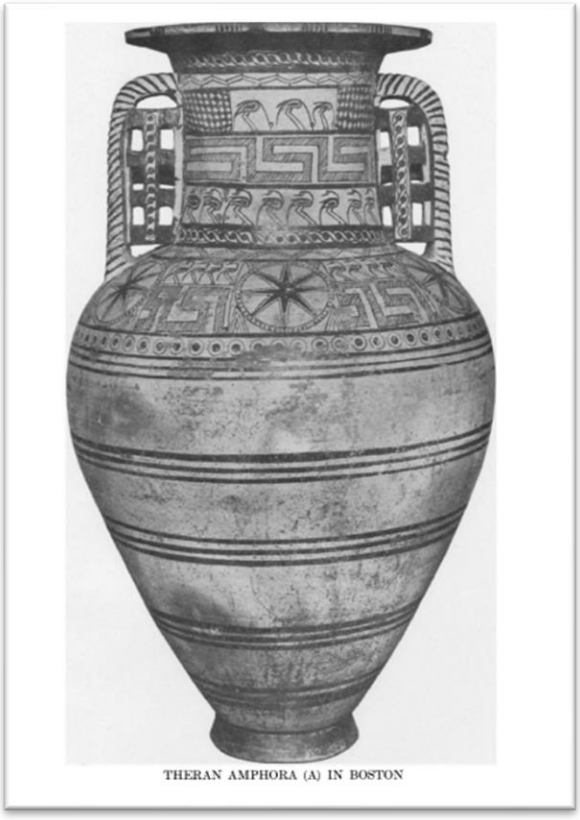
THERAN AMPHORA (A) IN BOSTON

***Figure 4.117 Theran amphora of unknown provenance. From Caskey 1914, Plate V.***

[966] Sperling 1974, 324.
[967] Caskey 1914, 297 published two amphorae from a private collection loaned to Boston Museum of Fine Arts. The items had been bought privately in Paris "some years before."
[968] Sperling 1973, 23.
[969] But there is no shortage of speculation. See Sperling 1973; Hdt. 1.153 …ἀπὸ τῶν χώρων ἁπάντων ἑπτὰ…, from all seven districts.

Thera presents a case of considerable archaeological bias. Since its discovery, the excavation of Bronze Age Akrotiri has dominated other projects.[970] The city of Ancient Thera was excavated by Hiller von Gärtringen 1895-1903, and its adjacent cemeteries by N. Zafeiropoulou in the 1960s.[971] Interest has focused on voluminous inscriptions found in ancient Thera, many related to the *Gymnopaidiai,* rather than the archaeology of the site.[972]

The Iron Age city of ancient Thera sits precipitously on the eastern spur of Mt. Prophitis Elias. Cliffs drop 300 m straight to the sea on three sides. The city is accessible by footpaths coming up from the coast at Kamari to the north or Perissa from the south. The footpaths meet at a saddle just west of the site entrance. Ancient cemeteries have been found at the saddle area.[973] The ancient city sits on a narrow spur, maximum width 200 m, extending about 700 m to the southeast, at a height ranging from 320 to 366 m.[974] The summit of Prophitis Elias is to the west of the saddle. The mountain is the only solid limestone bedrock on the island, everywhere else is volcanic ash.

[970] Doumas 2016.
[971] Tzachili 2005 on 19th century archaeology in Thera.
[972] Vidal-Lablache 1870-1.
[973] Kaklamani 2017.
[974] Sperling 1974, 324.

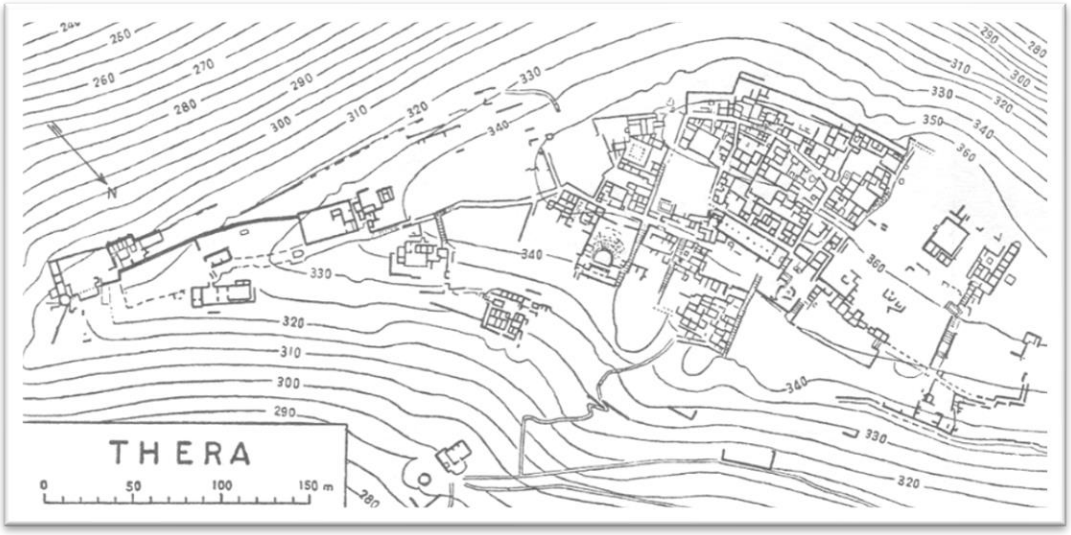


***Figure 4.118 Site plan of Ancient Thera, note orientation. From Sperling 1973.***

The site covers an area of about 70 ha., about half covered by buildings (see Fig. 4.118). Remains date mostly to the Hellenistic period. Geometric and Archaic levels are not reported but given the restricted topography of the site, the Hellenistic city plan probably followed the older routing. Building stone was quarried from the ridge where the city sits except for some decorative white marble and red volcanic stone. The agora occupied a long narrow platform ranging in width from 20 to 30 m extending about 100 m along the side of the mountain.[975] Foundations of shops are to seaward of the agora area while house foundations are on the opposite side, higher up the hill. Communal cisterns and houses with private cisterns suggest that rainwater was the only source of water.

The oldest part of the site is beyond a later 4th century theatre, to the southeast. Located on a panoramic promontory, the Sanctuary of the Dorian cult of Apollo Karneios spread over a series of terraces, part cut into the rock and part supported by a massive retaining wall (dated to 6th century with later repairs).[976] Within the

[975] Sperling 1974, 326.
[976] Eustathiou and Vitis 2006, 117, n6.

sanctuary a Temple of Apollo was to the north and large rectangular Terrace of the Ephebes to the southeast. The stylobate of the temple to Apollo Karneios was cut into the rock, orientated about 25 degree off an exact east/west alignment. The temple was fronted by a pronaos, a courtyard and further rooms, overall a space of about 32 m by 10 m. The courtyard covered a large cistern that collected the rain water from the temple precinct.[977] Eustathiou and Vitis proposed the temple design with two rows of columns suggested parallels with Zagora and Emporio in Chios, perhaps indicative of a wider 7th century architectural concept.[978] The Terrace of Ephebes was where ceremonies known as the *Gymnopaidiai* were held from the early 7th century. The area was covered with inscriptions and graffiti dated from 7th century through Classical into the Hellenistic period. These inscriptions have received the most scholarly attention at Ancient Thera, some of which are the earliest examples of the Greek alphabet in the Aegean (see Fig. 4.119).[979] Many of the inscriptions record names of boys with erotic descriptions.[980] The boys performed dances and did martial displays. Outlines of feet on the bedrock are common.[981] Guiding divinities for the cult were Hermes for mental aspects and Herakles for physical. Below the southeast corner of the terrace is a deep cave, commemorated as the sacred grotto of Hermes and Herakles. Inscriptions in the cave include those dated to the Archaic period on the left door jamb, Classical higher up, and many Hellenistic.[982]

[977] Eustathiou and Vitis 2006, 118-25.
[978] Eustathiou and Vitis 2006, 124.
[979] Mazarakis Ainian 1997, 331, n597 dated some to late 8th c. early 7th c.; Jeffery 1990, 318f; Carpenter 1933, 20, 26, Fig. 7.
[980] Santoro 2008, 203-4.
[981] Eustathiou and Vitis 2006, 119.
[982] Hiller von Gaertringen 1901.

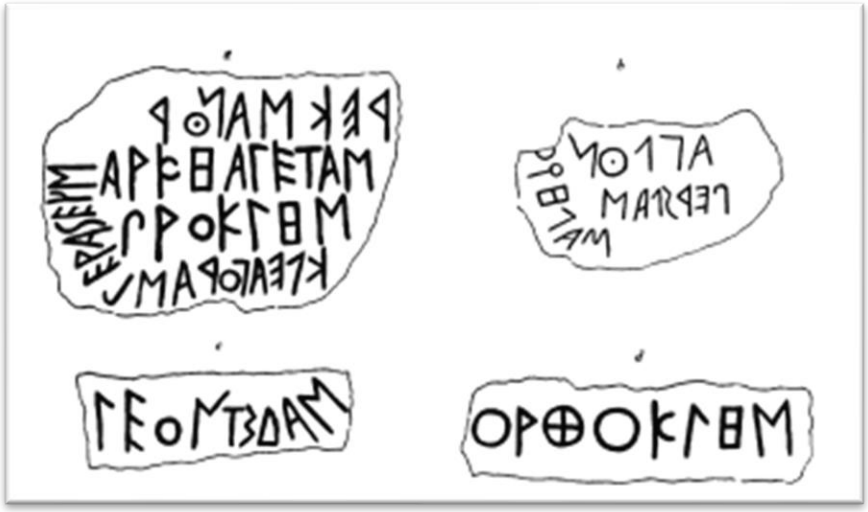

***Figure 4.119 Earliest Inscriptions from Thera. From Carpenter 1933, Fig. 7.***

Outside of the city, cemeteries were on either side of ancient pathways going up to the saddle. Archaic graves marked by *kouroi* included a 7th century Daedalic *kore* from the south facing slope, 2.3 m tall (now in Thera Archaeological Museum).[983]

The port areas were at the beaches below the town of Ancient Thera. To the north, the ancient port *Oea* is under modern Kamari. Rescue excavations have revealed some ancient remains which suggest the port was founded in 8th century.[984] There are two candidates for *Eleusis*, a matching port to the south of the mountain. Either the harbour of modern Vlychada, or at Emborio where spolia are evident. An earthquake in 1570 CE radically changed the coastline in this area which complicates analysis.[985]

### 4.5.1.3 Economy

While evidence from settlement sites and building architecture during the Iron Age is scant, pottery and coins are more prevalent in the archaeological record.

[983] McGilchrist 2010(1), 35, 50-1.
[984] McGilchrist 2010(1), 47-8.
[985] McGilchrist 2010(1), 73.

Finds from the Sellada cemetery near the saddle dated to the mid-7th century and included a range of items from various provenances including two silver rings with Egyptian (or pseudo-Egyptian) scarabs and Phoenician glass beads. Ceramics were mostly local, but with imports from Corinth, Crete, and Cyprus. A late 6th century grave complex from the same cemetery contained four pyre pits with Attic black figure cups.[986]

Thera's connection with Crete is best demonstrated in pottery distributions. Belly-handled amphorae moved from Athens to the Cyclades and on to Crete in the Early and Middle Geometric periods.[987] They are found on the mainland in Athens and the Argolid, in the Cyclades at Naxos and Thera (plus a fragment at Delos) and in Crete at Knossos (see Fig. 4.120). It seems a trade developed making and shipping these amphorae with the ultimate destination being Knossos.[988] From the second half of 9th century, nineteen imports of belly-handled amphorae have been found in Crete, all at Knossos: fifteen Attic and three Cycladic in the North Cemetery and one Cycladic at Fortessa. In Thera, a nearly complete Attic belly-handled amphora was found in grave 29 in the northern cemetery at Mesavouno. Imitations of the design came from grave 18 in the south cemetery at Perissa.[989] Late Geometric Theran potters were slow to adopt the Cycladic high-necked krater and continued to make neckless urns like those used in Crete. Finds of Cretan pottery in the Cyclades have largely been restricted to Thera.[990]

[986] Zafeiropoulou 1971, 226-30; Sheedy 2006a, 62.
[987] Whitley 2015, 108.
[988] On Cycladic material in Knossos see Coldstream 2006; 1996; 1990.
[989] Whitley 2015, 115-6.
[990] Coulié 2013, 233-5; Coldstream 2003, 288-9.

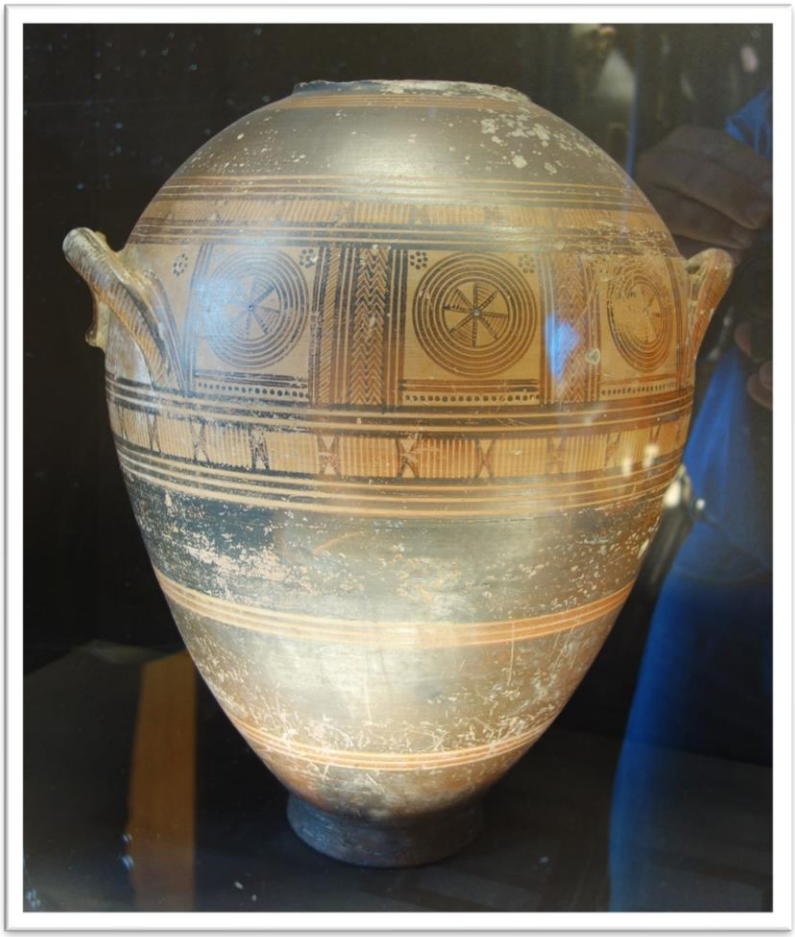

***Figure 4.120 Belly-handled amphora from Mesavouno, c. 850-800. From Louvre, no. A266.***

Parian Aa, wheel group, and Melian-ware was found on Thera, at Itanos in eastern Crete, and at Tocra in north Africa, suggesting a north to south trade route.[991] Cycladic pottery has been found in Crete at Azoria and Olous, and Cycladic one-handled cups were common in cemetery contexts such as the extra-urban sanctuary at Vamies near Itanos in the later 6th century.[992] Common types found at Itanos are skyphoi and cups with painted dots for decoration like those found

[991] Paspalas 2012, 80; Papadoupoulos and Smithson 2002, 163-6, 175, 178-9; Sheedy 1985, 188-9.
[992] Erickson 2011, 388-9; 2010, 40-1, 77-86, 231, 287-91, Fig. 9.30; Coldstream, Eiring, and Forster 2001, 23, 87.

at Despotiko (see Fig. 3.25).[993] The ceramic evidence supports the establishment of a trade route in the 6th century from the Cyclades to Crete, passing through Thera and Itanos as the two hubs. From Itanos, Cycladic traders could move south to North Africa or southeast to Egypt, then work their way up the Levantine coast to northern Syria and then back west to the Cyclades. Thera seems to have been an important node in this routing.[994]

The north to south trade perhaps underlies Herodotus's (4.150-.165) stories of the Therans founding colonies in North Africa at Plateia and Cyrene. Herodotus described a delegation of Therans wandering fruitlessly about Crete seeking information on Libya. Eventually, they came to Itanos where they met the murex fisherman Korobios who became their guide (Hdt. 4.154).

Regarding coinage, the Santorini hoard (*IGCH 7*) contained 760 coins dated *c.* 510-500. The hoard contained 541 Aeginetan coins, 127 from Cycladic islands including 82 from Kythnos and 23 minted on Thera, and 69 from elsewhere.[995] This is the second largest coin hoard found in the Cyclades after one from Naxos.

The Therans were assessed a mid-range amount of five talents in the 425/424 assessment of the Delian League. Seven islands were less and eight were greater (see Table 1).

## 4.5.2 Therasia

The western side of the Theran crater is formed by the small island of Therasia (see Fig. 4.116). A pre-eruption settlement at Koimissi has been found and is currently under excavation.[996] In 1866, a house or houses, were found in the Alaphouzos quarry on the southwest side of the island during quarry work to

[993] Erickson 2010, 294, n126.
[994] Viviers and Tsingarida 2014, 169-73; Erickson 2010, 233, 284, Fig. 11.1, n72; Vivers 2009.
[995] Sheedy 2006a, 62, 186-89 is a catalog of the hoard's contents.
[996] *AR ID* 6596, 2017, Koimissi; *AR ID* 5225, 2015; *AR ID* 4763, 2013.

supply building stone for the Suez Canal. Quarry work destroyed the structures before they could be examined.[997]

Some Geometric period pottery was found near the Monastery of the Assumption in the area of the Koimissi excavations.[998] No evidence of an Archaic or Classical period city was found in recent survey work.[999] Urban habitation on the island cannot be dated before 2nd century when Ptolemy refers to the island and city of Therasia (Ptolemy 3.15: Θηρασία νήσος καὶ πόλις). A Delian inscription from 236 mentions Thirasus (Θηράσιος) *IG* XI, 2.120. Hellenistic and Roman period surface pottery and some architectural remains exist on the hill of Profit Elias.[1000] Therasia is amalgamated with Thera in most accounts and is only rarely mentioned as a separate entity.[1001]

### 4.5.3 Anaphe

Anaphe lies 22 km east of Thera, is isolated, barren, rocky and virtually harbourless, with a total area of 40 km².[1002] The island is first attested in Apollonius of Rhodes as having been revealed to Jason by Apollo (Ap. Rhod. *Argon.* 4.1711, 1717). Another tradition records that Anaphe was founded at the same time as Thera by Phoenicians travelling with Membliaros companion of Cadmus.[1003] Epigraphically, the island's status as a *polis* was not attested until the 2nd century (*IG* XII.3 248), but Anaphe did appear in three of the Delian League tribute lists (428/427, 418/417, and 416/415 as a member of the Island District paying a

[997] Tzachili 2005, 244-5.
[998] Tzachili 2015, 121.
[999] Smonias, Farinetti, and Kordatzakis 2015; Tzachili 2015, 120.
[1000] Sperling 1973, 41.
[1001] Tzachili 2015, 119.
[1002] Bent 1885, 86 "there exists no island so remote in its solitude as Anaphi"; McGilchrist 2010(1), 92.
[1003] McGilchrist 2010(1), 94; Strabo *Geog.* 10.5.1.

*phoros* of 1,000 dr..[1004] A common assessment suggests the island may have had a *polis* structure in the Classical period. A late 6th century *kouros* from Anaphe known as the Strangford Apollo in the British Museum, is one of the earliest dated archaeological finds from Anaphe. The Museum recorded the *kouros's* fabric as Parian marble.[1005]

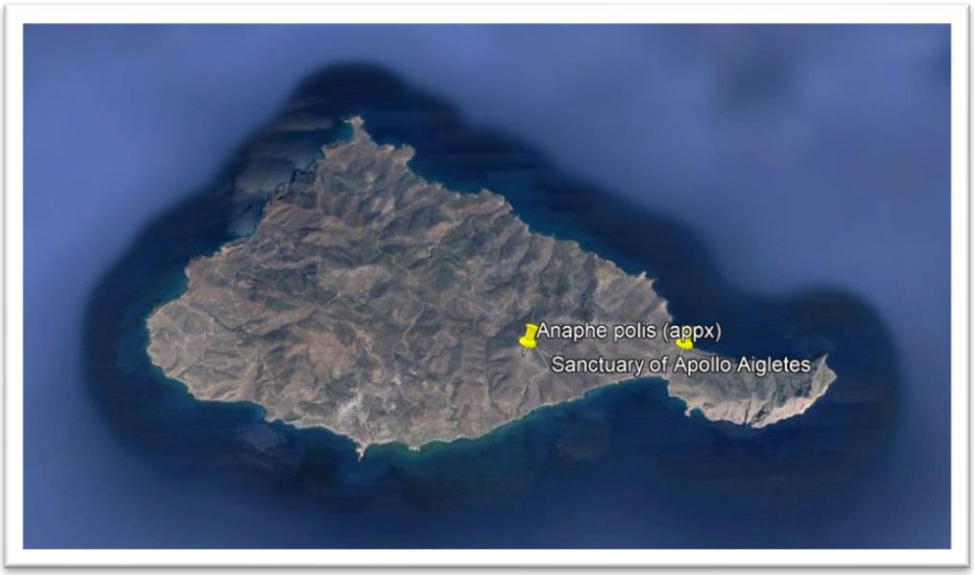


***Figure 4.121 Map of Anaphe. From Google Earth.***

The ancient city of Anaphe has not been excavated nor has the presumed port area below (see Fig. 4.121). There are significant Hellenistic and Roman remains both *in situ* and preserved as spolia in later buildings. To the east of the *polis*, at the narrow isthmus where the rock of Kalamos adjoins the island, are the remains of the Sanctuary of Apollo Aigletes. The temple remains are well preserved and many of the marble blocks have clear inscriptions. Masonry techniques and epigraphic evidence dates the sanctuary buildings to the 4th century. Marble was locally sourced and has a high quartz content.[1006] Speculatively, the temple

[1004] Reger 2004, 735 with inscription refs.
[1005] *The British Museum A-Z Companion* 2003, 177, item GR 1864.2-20.1.
[1006] McGilchrist 2010(1), 98-106; Reger 2004, 735.

complex could have been an economic asset for Anaphe attracting visitors to the island that would not have otherwise come. Fourth century fragmentary inscriptions contain lists of *proxenoi* of Anaphe in Olynthos, Thessalian Pharsalos, Mykonos, Knidos, Paros, Chios, and Telemessos (*IG* XII.3 250-1) indicating a wide area of interest for such a small island with limited natural resources but with a prime sanctuary as an attraction.

## 4.5.4 Amorgos

### 4.5.4.1 Introduction

Amorgos is the eastern-most Cycladic island. It stretches 33 km from end to end in a southwest to northeasterly orientation (see Figs 4.1, 4.122). Like Andros and Tenos, Amorgos is formed by a long ridgeline with a maximum height of 823 m and a total area of 121 km². The eastern side of the island is extremely steep-to, an aspect that creates very strong katabatic winds when the summer meltemi is blowing, creating a significant threat to navigation as the wind can drive straight down at considerable force. There are no natural harbours on the east coast. The west coast has two approachable harbours, Katapola in the middle and Aegiale in the north. Neither of these harbours are very secure in strong weather. The meltemi blows into Katapola and the bottom condition is poor holding for anchoring, mostly flat bedrock and grass. Consequently, while the position of Amorgos seems attractive to east/west sailing routes, in practice the poor harbours and dangerous katabatic winds make it unattractive from a maritime perspective. Donousa and the nearby Lesser Cycladic islands of Koufonisi, and Skinousa offer more secure anchorages.[1007]

[1007] Personal experience.

The Early Cycladic site of Markiani has been partially excavated by Marangou and survey work in the area has been undertaken by Whitelaw.[1008] Minoa, above the harbour at Katapola, has been excavated and published by Marangou as have Hellenistic towers in southern Amorgos.[1009] Aegiale and Arkesini have not been systematically examined.[1010] The lack of comprehensive archaeological attestation makes the formation of an island-wide understanding challenging.


***Figure 4.122 Amorgos with three Archaic poleis. From Google Earth.***

### 4.5.4.2 History

Earliest habitation evidence dated to the Late Neolithic and Early Bronze Age is represented best at Markiani but also from the summit at Minoa (see Figs 4.123,

[1008] Marangou *et al.* 2006, 9-24, 247; Whitelaw 2006.
[1009] Marangou 2002b *Amorgos I*; 2005 *Amorgos 2*; Marangou 2009 on tower.
[1010] Manoledakis 2012, 41; Marangou 2002b, 24.

4.124).[1011] Material finds from Markiani are considerably fewer than the density found at Dhaskalio (off western Keros): Talc ware from the western Cyclades was found thirty times more frequently at Dhaskalio and the quantity of Melian obsidian is half that found at Dhaskalio. This suggests that Markiani was an isolated community on the fringe of the Early Cycladic Aegean.[1012] Mycenaean tombs on the north side of Katapola Bay demonstrate Late Bronze Age activity at an accessible harbour location.[1013]

In the Iron Age, three *poleis* were established on Amorgos: Aegiale in the northeast, Minoa near the centre and Arkesini in the southwest (see Fig. 4.122).[1014] All three are on the western side of the island. None are port locations; Aegiale and Minoa are hill-top sites while Arkesine is on a precipitous promontory much like Zagora on Andros (see Figs 4.124, 4.128, 4.129). By ancient tradition each was founded as a colony: Aegiale by Miletus, Minoa by Samos, and Arkesini by Naxos.[1015] The three appear to have been independent of one another but are referred to in the Delian League Assessments by the collective Ἀμόργιοι.[1016]

The earliest Iron Age evidence from Minoa is in the so-called Temple area of the Lower City. The peribolos wall and some of the tombs within the enclosure date to late 10th or early 9th century (see Figs 4.125, 4.126). The area contained the remains of twelve funerary pyres. The ash deposit was in use from early 9th to early

[1011] Marangou *et al.* 2006; Marangou 2002a, 297; Mazarakis Ainian 1997, 196.
[1012] Marangou *et al.* 2006, 21-2.
[1013] Marangou 2002b, 20-21, Fig. 29.
[1014] Ps.-Skylax 58, τρίπολις; *IG* XII.7 68.1-2, ἡ πόλις [Ἀρκεσι]νέων καὶ ἡ πόλις ἡ Αἰγιαλέων καὶ [ἡ πό]λις ἡ Μινοητῶν; Manoledakis 2012, 41; Marangou 2002a, 295; Reger 2004, 734.
[1015] Marangou 2002b, 26-27, n54, n55, n66, n70, n71 for later period epigraphic evidence that referred to Samos and Miletus as mother cities. The colonization of Arkesini by Naxians is problematic. See Bonnin 2015 and discussion above in section 4.3.3.3; Marangou 2002b, 27; Lambrinoudakis 2004, 69-70, n54; Stephan of Byzantium is the ancient authority (*Ethnika* 4028.001) 86; Reger 1997, 472.
[1016] Marangou 2002b, 28, n80; Reger 2004, 734-5.

7th century (see Fig. 4.125, no. 4 – to left of stairway).[1017] Three elaborate burials from the Middle Geometric period were found a few meters east. Two were cremations; one female and the other a male warrior. A child was given a pithos burial.[1018] These graves were in a prime location adjacent to the city entrance. Marangou hypothesized that the funerary peribolos surrounded burials of an aristocratic group of the earliest inhabitants and could be interpreted as an ancestral tumulus (see Fig. 4.126).[1019] A later inscription from the Gymnasium referred to the area as, ἐν τῷ ἐπισφανεστάτω τόπῳ (ancestor's burial ground).[1020] This is suggestive of the tumulus over the Mycenaean wall and Protogeometric graves at Grotta.

Pottery found in undisturbed stratigraphy beneath later Hellenistic layers, dated to 10th century at the earliest. No Mycenaean structures or material has been found at Minoa.[1021] Geometric pottery from Attica, Naxos, Paros, Samos, East Anatolian Greek, and Euboea was found.[1022]

The upper town complex was at the summit, *c.* 255 m high. At the top was Building K. The space surrounding it had clear evidence of an evolving cult area from an open-air altar in the Protogeometric period, followed by a shrine within a small structure from the late 8th to 4th centuries.[1023] Two building phases are apparent; the building of terrace K2 and its subsequent enlargement (see Fig. 4.127). Numerous open-air pyres contained ash, charcoal, animal bones, seashells, pottery sherds, metal objects such as pins, fibulae, rings, and weapons including

[1017] Gounaris 2005, 46; Marangou 2002b, 175-7.
[1018] Marangou 2002a, 299; Mazarakis Ainian 1997, 247.
[1019] Marangou 2002b, 224.
[1020] *IG* XII 7, 235, 23; Marangou 2002a, 301.
[1021] Gounaris 2005, 46; Marangou 2002b, 118, n339.
[1022] Marangou 2002b, Attic Fig. 116.1, Naxian Figs 116,2-4, 117.3, 118.1-6, Parian Fig. 118.7, Samian Fig. 117.1.
[1023] Gounaris 2005, 46; Mazarakis Ainian 1997, 195-6.

arrows and spear heads and iron knives.[1024] A series of structures were built with benches within roofed and unroofed rooms. The sanctuary was expanded in late 8th or early 7th century, roughly contemporary with the building of fortification walls suggesting a planned community building program.[1025] Thirty-seven m below the summit on the south side of the hill, were approximately twenty houses. Narrow roads connected the area with the lower town.[1026]

In the Classical period, Amorgos does not appear often in the written record, only in two inscriptions, one from Minoa and the other from Aegiale.[1027] Plentiful finds of marble included gravestones, sculptures, and votives, as well as Parian and Samian ceramics. The Samian material suggests to Marangou evidence of Minoa having been a Samian colony.[1028]

As mentioned, due to the lack of attestation of other Iron Age *poleis* on Amorgos, our data set is incomplete making island wide analysis impossible. Minoa seems to have followed the pattern of social development as seen at Naxos and Xobourgo marked by foundational burials and subsequent diachronic changes in burial customs that seem to reflect a movement from a family based political structure to devolved authority in the Archaic period. Pottery suggest broad contact with Attica, other Cycladic islands, and Samos. There is no evidence at Minoa of economic activity beyond an agrarian base. The tribute requested in the Delian League assessment of 425/424 was a modest two talents collectively for the three *poleis* on the island (see Table 1).

[1024] Marangou 2002a, 297-9, 303; Mazarakis Ainian 1997, 196.
[1025] Marangou 2002a, 301-3; Mazarakis Ainian 1997, 196.
[1026] Marangou 2002a, 305.
[1027] Marangou 2002b, 27-8, Marangou used the term ἀνύπαρκτες, (non-existent).
[1028] Marangou 2002a, 305-8.


***Figure 4.123 Central Amorgos. From Google Earth.***

***Figure 4.124 Minoa. From Marangou 2002b, Fig. 109.***

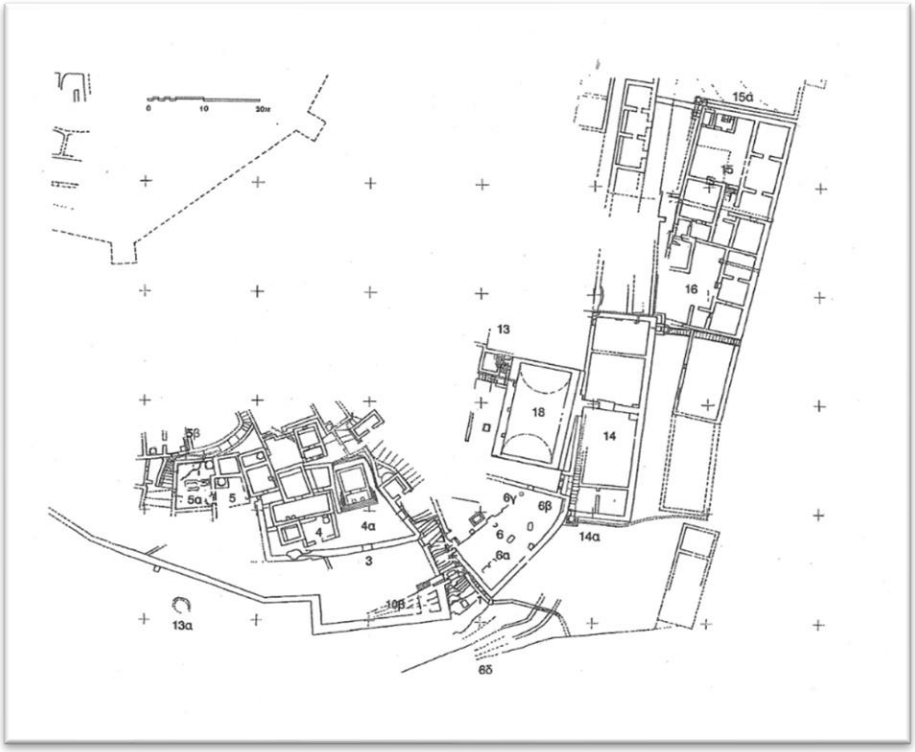


***Figure 4.125 Minoa Lower Town. From Gounaris 2005, Fig. 15.***

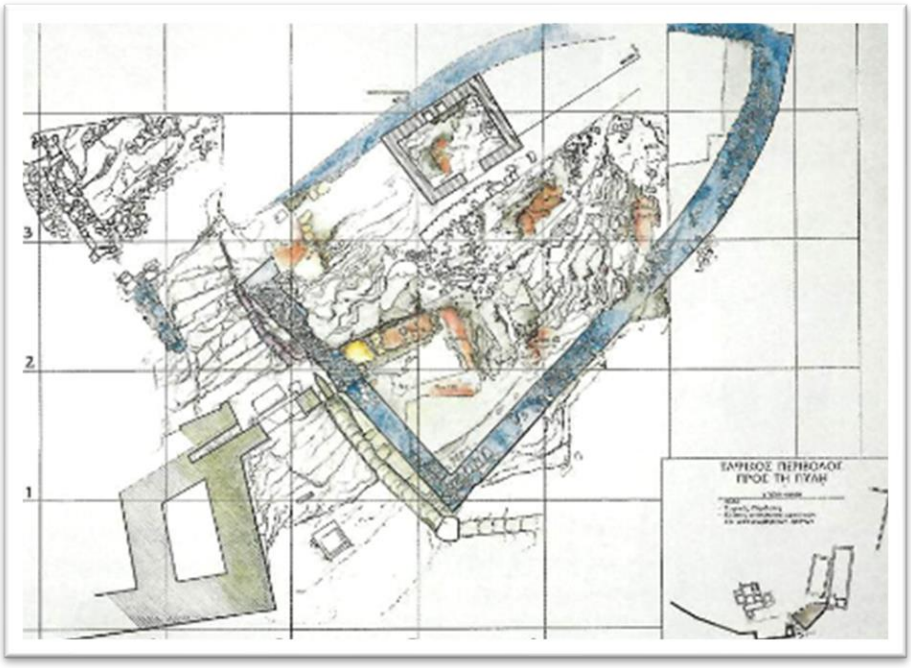


***Figure 4.126 Mino Lower Town Grave Enclosures. From Marangou 2002b, Fig. 198..***

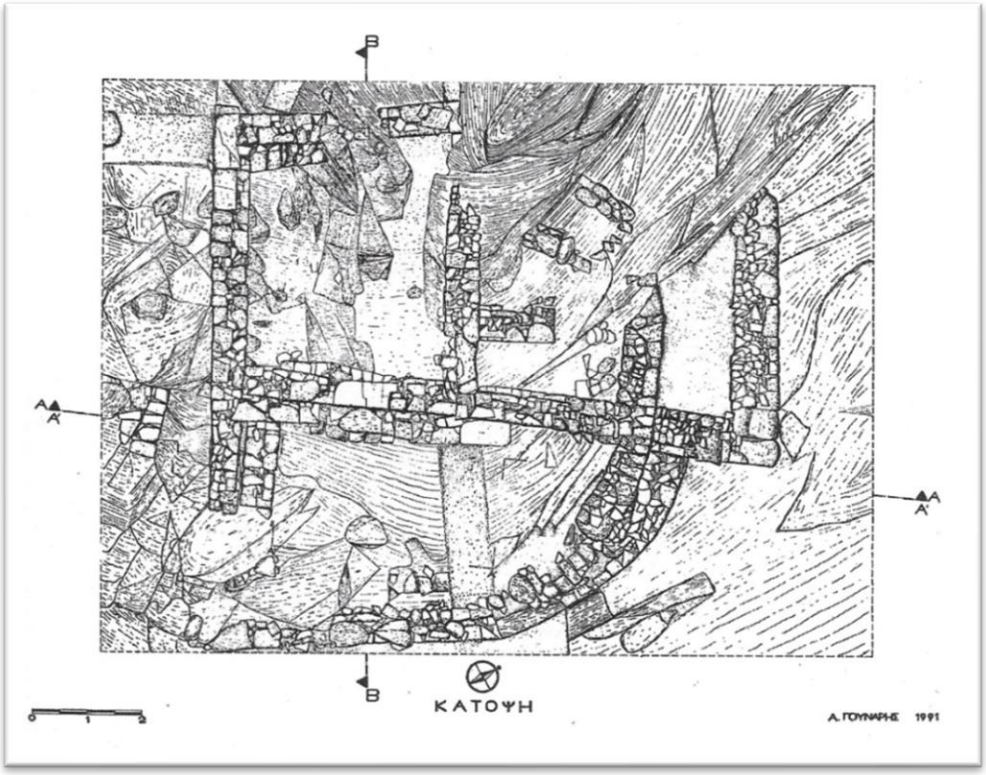


***Figure 4.127 Minoa Upper Town, Building K. From Gounaris 2005, Fig. 17.***

***Figure 4.128 Aegiale. From Marangou 2002a, Fig. 3.***

***Figure 4.129 Arkesine. From Marangou 2002b, Fig. 4.***

## 4.6 Other Islands

Twenty Cycladic islands have been examined above. In this section, we will discuss twelve islands for which some pieces of evidence from Iron Age contexts exists, but not enough to develop a fuller understanding of social processes or economic developments. Some of these islands had other periods of archaeological attestation such as Ios, Keros, and Syros with significant Early Bronze Age evidence, but as a group lack information from the Iron Age, either because of a lack of archaeological investigation or simply that they were underpopulated during the period.

### 4.6.1 Ios

Ios is twenty km north of Thera and a little less than twenty km from the south ends of Paros and Naxos (see Figs 4.1, 4.130). It is one of a band of smaller islands (Folegandros, Sikinos, Ios, and then the Lesser Cyclades) stretching west to east

comprising the densest concentration of Cycladic islands. Ios had a prominent Early Bronze Age settlement at Skarkos but the Iron Age record is poor.[1029] The island is 109 km² with a high point of 714 m; only five percent of the land is considered arable. Most of the arable land is concentrated around the excellent natural harbour at Ormos Bay on the west coast of the island. Both modern Chora and the Early Bronze Age settlement at Skarkos are proximate to this area. In antiquity, Ios was most famous as the burial place of Homer for whom there seems to have been some form of communal cult.[1030] Fourth century silver and bronze coins struck at Ios had a head of Homer on the obverse and the legend OMHPOY.[1031]

Traces of 6th century fortification walls built of local schist surround the hill above modern Chora.[1032] The town has not been excavated and the layout of the Archaic city is unknown.[1033] Ios was a member of the Delian League and made modest contributions; one talent in 454/453 reduced to 840 dr. in 450/449, raised to 3,000 dr. in 433/432 and back to one talent in 425/424.[1034]

The central location of Ios and the protection offered by the harbour at Ormos makes it curious that the Geometric and Archaic period footprint on the island is so light. The lack of arable land to support much of a population base seems the most reasonable explanation.

### 4.6.2 Sikinos

Sikinos is separated from Ios by six km and from Folegandros by ten km (see Fig. 4.130). Like neighbouring Folegandros, it is a rugged island, with a small harbour

[1029] McGilchrist 2010(20), 61.
[1030] See Plutarch *Vit. Hom.* 4; Strabo *Geog.* 10.5.1.
[1031] Reger 2004, 743.
[1032] Best visible on the north of the kalderimi step climb from the harbor to Chora.
[1033] Reger 2004, 743.
[1034] Reger 2004, 743 with inscription refs.

often inaccessible due to strong wind. Only 6% of its total area of 41.7 km² is considered arable. The island has a high point of 549 m. Solon (fr. 2 G.-P.²=1-3 W²) in his preamble to his presentations of reforms for Athens, said that he would rather be someone from Sikinos or Folegandros than fail in his duty to Athens, suggesting the lowness of the two islands' reputations in the Archaic period.[1035] In the Delian League assessment of 425/424, The Sikinians were assessed 1,000 dr. This was reduced to 500 dr. in the tables of 418/417, 417/416, and 416/415.[1036]

The acropolis of ancient Sikinos was on the western slope of the mountain Ayia Marina (444 m), in the southwest of the island. There are remains of retaining walls and fortifications of uncertain date scattered across the steep slope.[1037] At the northeast point of the island, near the south-face of Cape Malta, 230 m high on the cliff face, are the remains of Palaeokastro. Various periods of occupation dated by surface finds, included Early Bronze Age, Archaic, and Classical through to Byzantine can be noted. As at Ayia Marina, traces of walling are visible.[1038]

### 4.6.3 Folegandros

Folegandros is between Melos and Sikinos with an area of 32 km² and a high point of 416 m (see Fig. 4.130). Like Sikinos, it is a harsh environment in which to live, wind-swept, steep-sided, rocky with only 13% of the land classified as arable (see Table 1). Strabo (10.5.1), described Folegandros as σιδηρείν (iron-like).[1039] The only port area is a small harbour at the eastern end. The land rises immediately up to the cliff tops, 200 m above the sea below. Chora is 3 km west of the port.

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[1035] εἴην δὴ τότ' ἐγὼ Φολεγάνδριος ἢ Σικινήτης ἀντί γ' Ἀθηναίου πατρίδ ἀμειψάμενος. See Noussia-Fantuzzi 2010, 85, 213-14 for commentary.
[1036] Reger 2004, 772.
[1037] McGilchrist 2010(20), 95, 99-100. McGilchrist suggested that two now abandoned lime kilns in the area may have something to do with the lack of marble remains.
[1038] McGilchrist 2010(20), 100-1.
[1039] Strabo 10.5.1: Φολέγανδρος, ἣν Ἄρατος σιδηρείν ὀνομάζει διὰ τὴν τραχύτητα. Folegandros which Aratos named iron-like because of its rugged terrain.

Two sites have traces of Iron Age habitation. Palaeokastro Hill rises 353 m above the east side of Chora. Hellenistic retaining walls and pieces of Roman statuary are found along the path to the summit where traces of ancient walls as well as undated pottery can be found amongst mostly Mediaeval fortifications.[1040] Near the port of Karavostásis, in Pountaki just to the north of the harbour, are reported surface pottery dating from 2nd millennium BCE through to modern periods.[1041] In a fragment of Solon's (fr. 2, n1061 above) and in a 4th century proxeny decree (*IG* XII.59.15), the collective city-ethnic term of Φολεγάνδριος was used, perhaps indicating the settlements at Palaeokastro and the one near the port, were considered *poleis.* 'Folegrandians' also was used in the Delian League Assessments of 425/424, 417/416, and 416/415, at a rate of 2,000 dr., (but was not recorded in the full panel of 441/440).[1042]

On the northeast side of Folegandros is the cave complex of Chrysopelia. Inside the cave on the walls and roof are preserved graffiti dating from the Archaic to Roman period. Over 400 male names and a few female ones are found, often together with their place of origin. Vassilopoulou suggests these were the names of teenage pilgrims.[1043]

[1040] Vassilopoulou 2018, 339; McGilchrist 2010(20), 115-16.
[1041] Vassilopoulou 2018, 339; McGilchrist 2010(20). 118.
[1042] Reger 2004, 769.
[1043] Vassilopoulou 2018, 342-4.


***Figure 4.130 From left to right: Folegandros, Sikinos, Ios. In upper right is south-eastern Herakleia. From Google Earth.***

## 4.6.4 Rhenia

Rhenia is closely associated with neighbouring Delos, separated in places by a channel less than 700 m wide (see Fig. 4.1). Much of the southern portion of the island seems to have been under direct control by Delos either as dedicated cemetery sites or in land belonging to Apollo.[1044] Thucydides (3.104) recorded that when Polycrates of Samos was at his strongest (late 6th century), he conquered Rhenia and dedicated the island to the Delian Apollo which he demonstrated by dragging a chain across the channel thereby connecting the two islands. Thucydides in the same passage described the purification of Delos in 426/425 when all bodily remains of those who had died on Delos were exhumed and (presumably) moved to Rhenia. Thucydides noted that a previous, but less extensive purification, had taken place under Pisistratus. Finds from the reburials

[1044] Reger 2004, 740, 769.

date from the Geometric period to early 5th century and are more properly considered Delian than Rhenian.[1045] Strabo considered Rhenia a desert island where the Delians buried their dead.[1046]

The urban centre for Rhenia was on the west coast of the northern portion of the island. Remains of a late 2nd century temple of Herakles are extant.[1047] The Rhenieus appeared on the Delian League Tribute lists eleven times between 451/450 and 416/415 for very modest amounts. In 451/450 the *phoros* was 1,000 dr., reduced to 300 dr. the next year. In the 425/424 increased assessment the amount reverted to 1,000 dr. but was reduced to 500 dr. thereafter.[1048]

### 4.6.5 Syros

Syros is a very perplexing island during the Iron Age**.** The island is 85.2 km² with 29% of the land considered arable, a percentage equal to Paros and greater than Naxos. The south of the island seems well watered.[1049] Syros is centrally located and has several excellent harbours on the east and west coasts and in the north (see Fig. 4.1). Yet, despite these apparent advantages for economic productivity, the Syrians seem not to have developed economically during the period; they were assessed just one talent in the 425/424 high assessment by the Delian League.

The ancient *polis* of Syros is under the present city of Ermoupolis and uncovered remains are few except for sections of fortification wall and some theatre seats in

[1045] McGilchrist 2010(4), 110.
[1046] Strabo *Geog.,* 10.5.5: Ῥήνεια δ’ ἔρημον νησίδιόν ἐστιν ἐν τέτρασι τῆς Δήλου σταδίος, ὅπου τὰ μνήματα τοῖς Δηλίος ἐστίν.
[1047] McGilchrist 2020(4), 109; Reger 2004, 769.
[1048] Reger 2004, 769.
[1049] Eumaeus the swineherd described Syros to Odysseus as “it has as good land, rich in herds, rich in flocks, full of wine, abounding in wheat.” *Ody.* 15.403-8: Νῦσός τις Συρίν…ἀλλ’ ἀγαθὴ μέν, εὔβοτος, εὔμηλος, οἰνοπληθής πολύπυρος; Reger 2004, 775 claimed Συρίν is misidentified as Cycladic Syros; Meyer, E. 1975. ‘Syros.’ *Kl. Pauly* V.474, supports the identification as Cycladic Syros.

the area of Psariana, west of the harbour.[1050] In the south of the island, near Galissas on the west coast, Archaic and Classical remains dating from the 8th century have been found.[1051] In the bay of Grammata, a protected anchorage where ships could safely wait for a change in the weather before proceeding, are evocative carvings by ancient mariners in the smooth rock faces on the western side of the bay.[1052]

The Syrians appear in the Delian League tribute lists twelve times from 451/450 to 416/415. In 451/450 the *phoros* was 1,500 dr. reduced to 1,000 dr. by 448/447. This was raised to 1,500 dr. in 433/432, and in the high assessment of 425/424 to one talent. Syrian produced coins are not known before the Hellenistic period.[1053] For an island with seemingly such an array of physical advantages, the lack of a footprint on the Archaic and Classical record of the Aegean is vexing.[1054] Based on pure speculation, the south of the island has some large wetland areas that may have been malarial. Perhaps this made the island an unattractive place to live.

### 4.6.6 Lesser Cyclades

The Lesser Cyclades consist of Herakleia, Schinousa, Koufonisi, Kato Koufonisi, Ano and Kato Antikeri, and Keros (see Fig. 4.131). These islands off the southern end of Naxos form a close archipelago and were important centres of habitation in the Late Neolithic and Early Bronze Age with Keros probably serving as a sacred island, like the role of Delos in the Archaic and Classical periods.[1055]

Herakleia and Schinoussa both have scattered pieces of ancient masonry usually preserved as spolia in later church buildings. At the south end of the beach of

[1050] McGilchrist 2010(18), 107, 127; Reger 2004, 775.
[1051] McGilchrist 2010(18), 107, 140.
[1052] McGilchrist 2010(18), 149-51.
[1053] Reger 2004, 775-6.
[1054] Rutishauser 2012, 33 concurs.
[1055] Renfrew 2011, 135-202; Broodbank 2008; 2000.

Tsigouri Bay on the west of Schinousa was a large scatter of uncontextualized pottery including cup bases and amphorae handles.[1056] On Koufonisi, behind Pori Bay, a Late Geometric settlement has been found.[1057] Keros was called Keria (Κερία) in the Classical period. The islanders (Κεραίτας) appear on the 425/424 Athenian tribute assessment for a *phoros* of 13 dr. Curiously, the entry was inscribed to the right of the city-ethnic name while all others were to the left.[1058]


***Figure 4.131 Lesser Cyclades. From Google Earth.***

[1056] McGilchrist 2010(17), 159.
[1057] McGilchrist 2010(17), 162 wrote that the settlement evidence behind Pori Bay was on Kato Koufonisi This is in error as Pori Bay is at the east end of (Ano) Koufonisi. A surface survey was done on Kato Koufonisi in summer 2018 (unpublished). Per personal conversation with H. Indgjerd, one of the participants, no Geometric settlement was found.
[1058] Reger 2004, 751.

## 4.7 Summary and Analysis

The site analysis covered a wide range of evidence. What is apparent is the need to examine all the islands before arriving at conclusions. If we had just considered the western islands, the conclusion would be that the islands were deserted after the Late Bronze Age, new people arrived in the Geometric period and exploited the various mineral resources available on each island. The central islands would lead to a different conclusion. The material record from these islands suggests continuity from the Bronze Age. The economy was focused on subsistence agriculture until the opening of very large-scale marble quarries in the Early Archaic. The scale of the projects suggests some system of property rights was agreed, indicative of social and political change. The material finds on the northern tier islands suggest a close affiliation with Euboea and involvement in maritime trade with northern Syria. The southern islands seem generally insignificant and suggest the Cyclades did not really amount to much at all in the Iron Age. Yet, when we compile all the material evidence from each island, a much more varied and complex picture is apparent.

Table 3 below is a summary of the site evidence compiled by island, arranged in order of discussion within this chapter, with notes on various points discussed. The categories selected for inclusion follows, to a degree, Morris's Trait Lists for societal regeneration following a collapse (discussed further in Chapter 6).[1059] Periodization of development for certain aspects is noted.

Diachronic population changes will be analysed in this section. An analysis of economic growth and social development in the Cyclades will be conducted in Chapter 5.

[1059] Morris 2006, 73-81.

***Table 3 Data Summary***

| **SUMMARY DATA FROM SITE REPORTS** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | KEY: PG=PROTOGEOMETRIC, G= GEOMETRIC, A=ARCHAIC | | | | | |
| | | | | | X=NO ATTESTATION, ?=UNCERTAIN | | | | | |
| **ISLAND, SECTION REF.** | **FARMLAND KM²** | **SETTLEMENTS** | **FUNERARY** | **SANCTUARY** | ***POLIS*** | **MONUMENTAL** | **FORTIFICATION** | **EXTRACTION** | ***PHOROS*** | **MINTED** |
| *Arranged by Order of* | | **ESTABLISHED** | **EVIDENCE** | **URBAN OR** | | **ARCHITECTURE** | **WALLS** | **ACTIVITY** | **425/4** | **COINS** |
| *Site Report* | | **WITHIN** | | **EX-URBAN** | | | | | | |
| **KEOS, 4.2.2** | 49.80 | G, A | PG, G, A | PG, G, A | FOUR | YES | YES | MILTOS | 10 T | YES |
| **KYTHNOS, 4.2.3** | 27.00 | PG, G, A | X | G, A | SINGLE | YES | YES | YES | 6 T | YES |
| **SERIPHOS, 4.2.4** | 8.30 | A | X | X | X | X | X | IRON MAYBE | 2 T | MAYBE |
| **SIPHNOS, 4.2.5** | 13.30 | G, A | G, A | G, A | SINGLE | YES | YES | GOLD, SILVER | 9 T | YES |
| **MELOS, 4.2.6** | 19.50 | G, A | G, A | G, A | SINGLE | YES | YES | KAOLIN | 15 T | YES |
| **KIMOLOS, 4.2.7** | 10.21* | G, A | G, A | ? | ? | ? | YES | KAOLIN | 1,000 DR | X |
| **PAROS, 4.3.2** | 61.00 | PG, G, A | PG, G, A | PG, G, A | SINGLE | YES | YES | MARBLE | 30 T | YES |
| **NAXOS, 4.3.3** | 98.30 | PG, G, A | PG, G, A | PG, G, A | SINGLE | YES | YES | MARBLE, EMERY | 15 T | YES |
| **DONOUSA, 4.3.4** | 2.21* | G | X | X | X | X | YES | X | - | X |
| **ANDROS, 4.4.1** | 33.10 | PG, G, A | G, A | G, A | SINGLE | YES | YES | LATER | 15 T | X |
| **TENOS, 4.4.2** | 41.10 | PG, G, A | PG, G, A | G, A | SINGLE | X | YES | LATER | 10 T | MAYBE |
| **MYKONOS, 4.4.3** | 15.80 | ? | A | X | TWO ? | X | X | X | 2 T | X |
| **DELOS, 4.4.4** | 0.44* | G, A | X | G, A | SINGLE | YES | X | TOURISTS | - | X |
| **THERA, 4.5.1** | 45.60 | G, A | G, A | G, A | SINGLE | YES | X | MAYBE PUMICE | 5 T | YES |
| **THERASIA, 4.5.2** | 2.80* | ? | X | X | LATER | X | X | ? | - | X |
| **ANAPHE, 4.5.3** | 3.26* | A | X | A | LATER | YES | X | ? | - | X |
| **AMORGOS, 4.5.4** | 11.30 | G, A | G, A | PG, G, A | THREE | ? | X | X | 2 T | X |
| **IOS, 4.6.1** | 6.00 | A | A | ? | SINGLE | ? | YES | X | 1 T | X |
| **SIKINOS, 4.6.2** | 2.30 | A | ? | ? | SINGLE | X | YES, UNDATED | X | 1,000 DR | X |
| **FOLEGANDROS, 4.6.3** | 4.40 | YES, DATE ? | X | A | SINGLE | X | YES, UNDATED | X | 2,000 DR | X |
| **RHENIA, 4.6.4** | 10.21 | YES | G, A | LATER | SINGLE | ? | ? | X | 1,000 DR | X |
| **SYROS, 4.6.5** | 24.30 | G, A | ? | X | SINGLE | ? | YES | X | 1 T | X |
| **LESSER CYCLADES, 4.6.6** | | G, A | G, A | ? | ? | ? | ? | X | 13 DR | X |
| *ESTIMATED FARM AREA BY AUTHOR FROM AERIAL PHOTOGRAPHS OF TRACES OF TERRACE WALLS | | | | | | | | | | |

### 4.7.1 Population Levels by Period

Estimating population levels before accurate census records existed is challenging. Multiple approaches utilizing a variety of surrogates preserved in the archaeological record have been attempted with varying degrees of success. Population estimation methodologies as well as an attempt at estimating the Cycladic population are discussed in greater detail in Appendix D.

A summary of the diachronic settlement pattern is presented in four maps below. The data is derived from the site reports above, summarized in Appendix B, Table 5 (B1). The maps show archaeologically attested settlement sites in the Cyclades in the Late Bronze Age, Protogeometric, Late Geometric, and Archaic Periods.

In developing Appendix B, the inconsistency of the archaeological record for the Cyclades was repeatedly demonstrated. The data compiled is based on secure archaeological finds as reported above but in some cases assumptions were made regarding dating. As an example, on Amorgos, of the settlements at Arkesine, Minoa, and Aegiale, only Minoa has been systematically excavated, leaving the dating of the other settlements less certain. The ancient record suggests the other sites were Iron Age colonies.[1060] Dating Arkesine and Aegiale to Geometric period occupation seems reasonable. Mycenaean burials on Amorgos and Tenos have been found but no associated settlement sites have been identified. For this exercise, a settlement corresponding with the burials was assumed in compiling the Late Bronze Age data base.

The lack of survey work in the Cyclades makes the catalogue of identified settlement sites produced here open to subsequent reinterpretation. Catling's 2005 survey in Melos identified several important Iron Age sites (Emborio) that

[1060] Ps.-Skylax 58, τρίπολις; *IG* XII.7 68.1-2, ἡ πόλις [Ἀρκεσι]νέων καὶ ἡ πόλις ἡ Αἰγιαλέων καὶ [ἡ πό]λις ἡ Μινοητῶν; Manoledakis 2012, 41; Marangou 2002a, 295; Reger 2004, 734.

Cherry's 1976 survey had missed (see Melos, section 4.2.6.2). Future surveys could reasonably be presumed to find sites not currently identified that may require modifications to the database presented here.

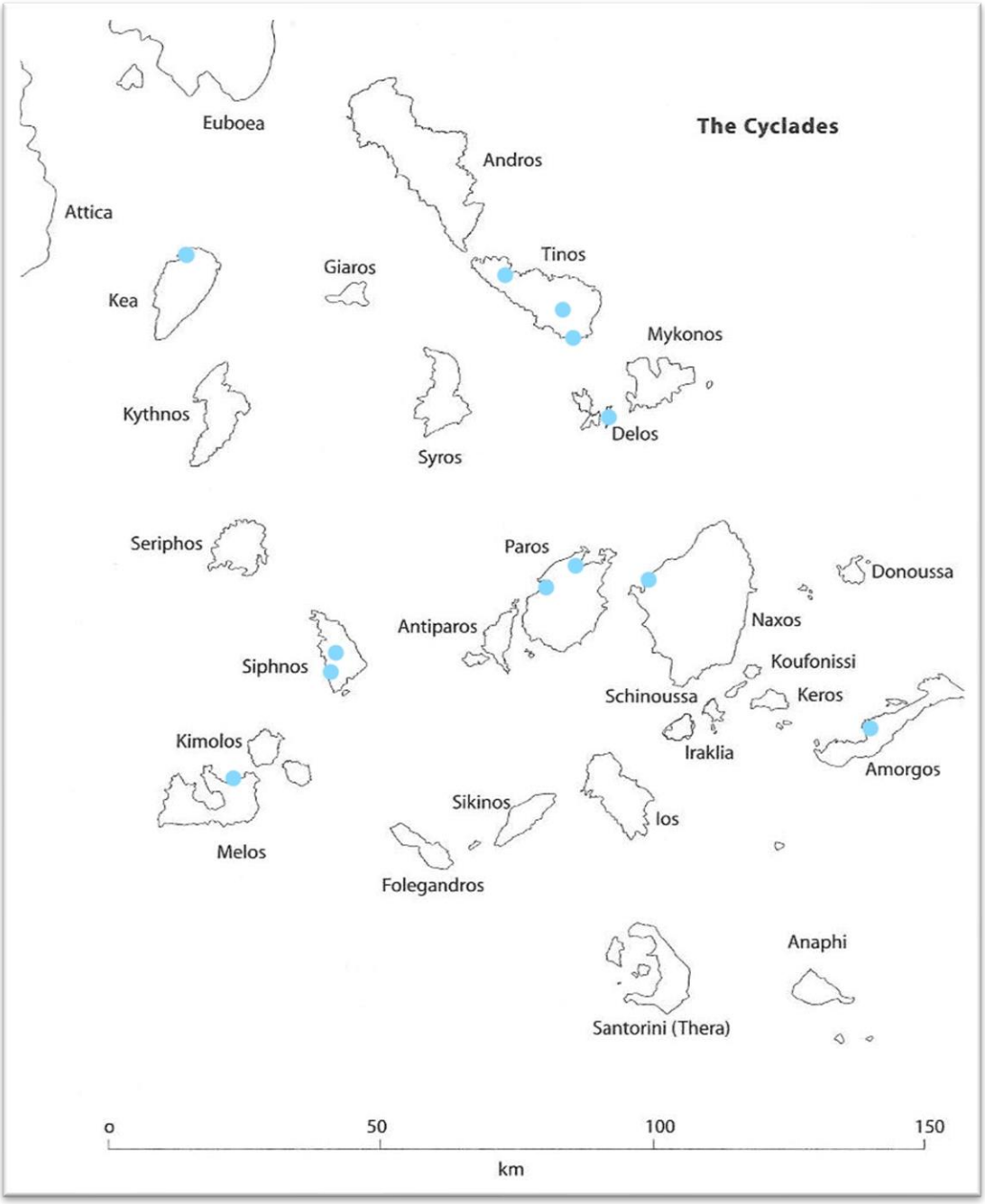


***Figure 4.132 Late Bronze Age Settlement Sites. Settlements have been inferred from LBA cemeteries on Tenos and Amorgos. Base map from Brodie, et al. 2008, preface.***

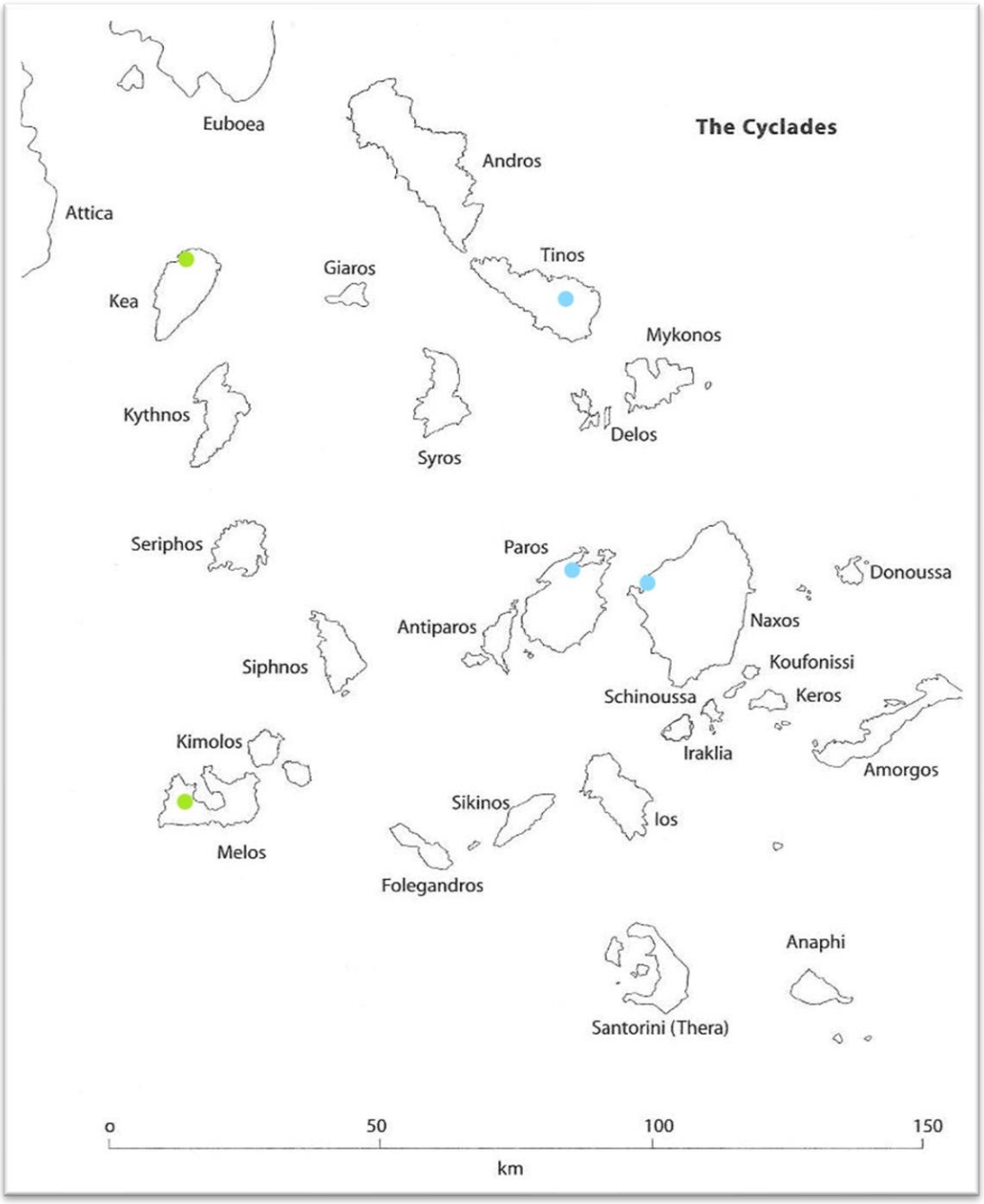


***Figure 4.133 Protogeometric Settlement Sites with secure evidence in Light Blue, possible PG evidence in Green (Temple A from Ayia Irini on Keos and Aghios Spyridon on Melos). Base map from Brodie, et al. 2008, preface.***

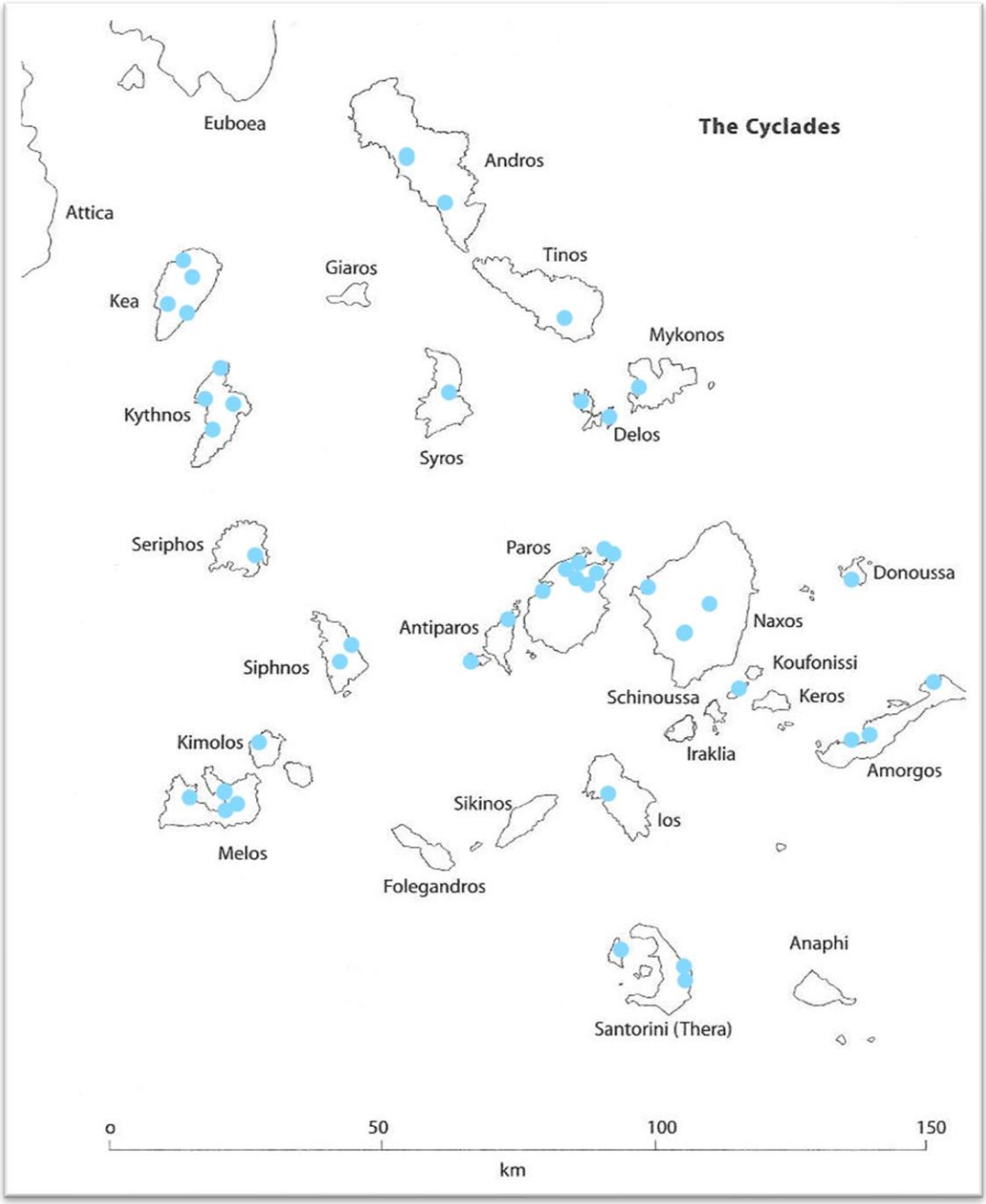


***Figure 4.134 Late Geometric Settlement Sites c. 800 – 700 noted in light blue, shows considerable settlement growth in Cyclades from Protogeometric period. Base Map from Brodie, et al., preface.***

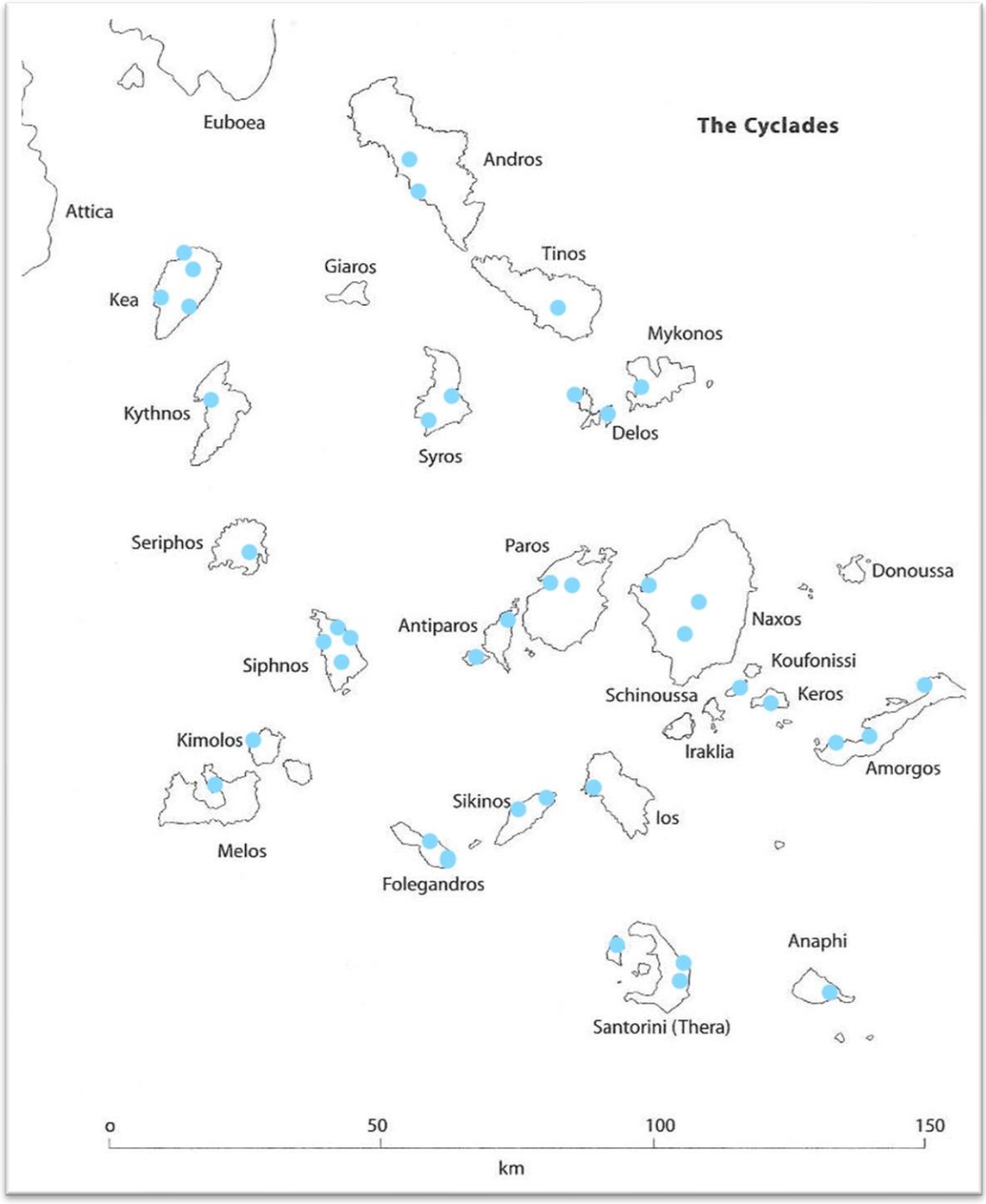


***Figure 4.135 Early Archaic Settlement Sites c. 600, some consolidation of Geometric period sites can be observed. Base map from Brodie, et al., preface.***

Though from slightly different periods (about 100 years different), the Cycladic Late Bronze Age settlement footprint of nine attested and two inferred sites is small compared to Crete's 130 attested post-destruction Late Minoan IIIC settlements sites (see Fig. 4.132).[1061] The archaeological work is partially responsible for this as Crete has been extensively surveyed while the survey record for the Cyclades is poor, suggesting that Late Bronze Age evidence in the Cyclades may be underreported.

In the centuries after the Late Bronze Age collapse, the number of known settlement sites in the Cyclades decreased (see Fig. 4.133). The Protogeometric site data is presented in Appendix B. Others have noted the decline as well; Snodgrass's 1987 map shows only one Cycladic site dated 1050-1000.[1062] Only from Grotta on Naxos is there secure evidence of continuity from the Late Bronze Age. Tenos and Paros have scattered finds of Late Helladic IIIC and Early Protogeometric ceramics that suggest some level of habitation may have continued. The evidence for Aghios Spyridon is equivocal but was included in Fig. 4.133. The Bronze Age centres of Aghios Andreas, Phylakopi, and Ayia Irini were abandoned in the early 11th century. On Andros, Keos, Melos, Thera, and Siphnos there seems to have been a considerable gap in the record.[1063] Keos is a good example of how confusing it can be to interpret what occurred. There are no signs of Protogeometric settlements on Keos and only one securely dated Protogeometric potsherd which suggests an empty island, yet there was evidence of sporadic cult activity in Temple A at Ayia Irini prior to the founding of the four Archaic period *poleis*.

[1061] Wallace 2006, 163.
[1062] Snodgrass 1987, Fig. 5.2.
[1063] Catling 2005; Cherry 1982b, 306 calls LHIIIC material equivocal, two sherds of PG date were found.

An analysis of the surface area of sites shows a decline as well. The cumulative area of the three best documented Late Bronze Age sites, Aghios Andreas, Ayia Irini, and Phylakopi, was 35,700 m².[1064] The surface area of Protogeometric settlement at Koukounaries, plus the distributed area of Protogeometric pottery at Xobourgo, and an estimated area of Protogeometric Grotta, in total is miniscule by comparison; perhaps 2,750 m²; 28% the area of Ayia Irini, the smallest Late Bronze Age site of the three.[1065]

The interpretation of a decrease in settlements throughout the Cyclades is supported by the paucity of Protogeometric pottery (see Appendix B, Table 6 (B2)). Only eight islands have documented Protogeometric ceramic evidence.

Whether the population declined between 1200 and 1000 as well is less clear. People may have undertaken practices that did not leave an archaeological record. Papadopoulos has argued for a decentralization of population rather than a reduction.[1066] A return to a pastoral economy has been postulated for Nichoria and Lefkandi on the mainland.[1067] Snodgrass discussed pastoral patterns in general in the Early Iron Age.[1068] Mazarakis Ainian in his survey of Iron Age buildings, suggested that Protogeometric buildings were commonly built from mud-brick or other perishable materials which do not leave an easily identifiable archaeological footprint (see Fig. 4.136).[1069] Murray discussed other issues with the archaeology such as the challenge of properly identifying Protogeometric ceramic material

[1064] Ag. Andreas 11,070 m² (see Fig. 4.25); Ay. Irini 9,897 m² (Wilson 2013, Fig. 1); Phylakopi 14,733 m² (Renfrew *et al.* 2007, Fig. 2.1). Area calculated from Google Earth by author.
[1065] PG settlement of Grotta has not been located, area was estimated at 10x10 excavation squares each of 5 m a side, total area 2500 m²; Koukounaries settlement area with PG walls is small, only 6m x 4.5m, this area was doubled to 54m² in the calculation used herein, note this is the only evidence of PG structures, see Fig 4.34; Xobourgo PG and LHIIIB sherds came from 8 excavation squares on terrace above Cyclopean Wall, area 200 m² see Fig. 4.112.
[1066] Papadopoulos 2014, 178; 1996, 254.
[1067] Thomas and Conant 1999.
[1068] Snodgrass 1987, 193-209; see also Bresson 2016, 132-3.
[1069] Mazarakis Ainian 1997, 100.

from other finds and the ever-present complication of surveys focused on other periods not seeing items outside their target.[1070] We cannot dismiss the possibility that the archaeological record misses a segment of the population and that segment may have been significant.[1071]

***Figure 4.136 Modern mudbrick shed near Ancient Olympia.***

If the roof was made of thatch or clay building material of similar durability to the mud bricks, the building would leave almost no trace of its existence.

The lack of much survey work in the Cyclades and the difficulty of identifying and properly assigning material remains to the Protogeometric period probably impacts the poor material record of the period. This makes developing a clear understanding problematic. While the material record suggests a very low level of population one must be cautious in making this a statement of fact. As Papadopoulos has argued, decentralization rather than depopulation may have

[1070] Murray 2017, 214-7, 230; Morris 2007, 218.
[1071] see Papadopoulos 2014 for the arguments supporting LBA to EIA continuity.

been closer to the reality of the situation. With the proviso of undocumented populations in mind, based on the observable physical evidence from which we can propose a positive attestation, it does seem that in the 11th and 10th centuries the population living in the Cyclades was low.

Settlement evidence from the Geometric period suggests population in the Cyclades increased from the Protogeometric (see Fig. 4.134). The population built slowly throughout the Geometric period. Zagora was founded *c.* 925 and was occupied until *c.* 700.[1072] About thirty homes have been identified (see Fig. 4.92).[1073] Schilardi did not give a definitive number for houses at Koukounaries but an examination of the site and diagrams suggests around twenty structures were probably residences by the Middle Geometric period (see Figs 4.34, 4.37).[1074] At Aghios Andreas on Siphnos, 8th century habitation was concentrated in the northern section of the older Bronze Age fortified settlement.[1075] About fifteen housing structures can be identified in the earliest part of the resettled area (see Fig. 4.25). If we speculatively assume eight inhabitants per house, the population of these settlements is roughly 100-200 people each. Even if we double or triple these estimates to provide a margin for error, we still are dealing with settlements of less than 1,000 in the Early and Middle Geometric periods.[1076] Estimating population in the Late Geometric is complicated because there are few Late Geometric sites where the record is not covered by subsequent building activity. Aghios Andreas is probably the site least disturbed by later building. There the housing area roughly quadrupled between re-habitation in the Early Geometric and the Late Geometric, eventually extending to the limit of the Bronze Age

[1072] Cambitoglou 1981, 20.
[1073] Vink 1997, 126; Green 1990; Cambitoglou 1981, 34.
[1074] Schilardi 2012, 91-3, Fig. 1; 1983, 175.
[1075] Televantou 2017, 367; 2008, 25, 42-3; Mazarakis Ainian 1997, 255.
[1076] See Murray 2017, 214-5; Hall 2014, 75 estimated population of Zagora between 90-375; Green 1990.

settlement. Four centuries passed between the two periods of peak habitation at Aghios Andreas, the Late Bronze Age and the Late Geometric.[1077]

In the Archaic period, the evidence indicates the beginning of consolidation from multiple smaller Geometric sites to single, larger *polis* centres, most notably on Andros, Kythnos, Melos, and Paros (see Fig. 4.135). Extensive circuits of fortification walls as seen at Paroikia (Fig. 4.50), Palaeopolis on Andros (Fig. 4.95), Ancient Melos (Fig. 4.29), Vrykastro on Kythnos (Fig. 4.22), and attested through literature at Naxos, suggest significant population growth at these centres.[1078]

Population growth in conjunction with the observable increase in both number and area of sites must have been considerable. The increase in material evidence was probably from a combination of capturing archaeologically the descendants of the unattested Protogeometric inhabitants, organic growth of the archaeologically observable Protogeometric population, and new arrivals.[1079] As mentioned, a wetter climate regime that allowed for more productive agriculture may have been the prime factor that supported population expansion.[1080] Expansion of agricultural practices must have occurred in keeping with population growth which argues for increased terracing and reclamation projects of marginal land areas on the islands with significant increases in population.

Economic growth is discussed in the next chapter, but the conclusion that will be reached is that on many of the islands, conditions in the late 500s were arguably as propitious a period for the Cyclades as ever occurred. Ober postulated that the

[1077] Televantou 2008a, 64-6.
[1078] On Vrykastro see Mazarakis Ainian 1998, 369; Hdt. 5.33-4 on walls at Naxos; see also Osborne 2009, 29-31 on birth-rates and mortality as the underlying factors behind rate of population growth; Morris 2007, 216-7 presented a good general case for population decline and growth but noted the limits of the archaeological evidence.
[1079] Wagstaff and Cherry 1982 suggest all the southern Cycladic islands were deserted and that newcomers in the 9th c. brought the Doric characteristics with them; Malkin 2011, 78.
[1080] Morris 2007, 236; 2004, 730.

total Greek development index peaked in the Hellenistic period at a level not approached again until the 20th century.[1081] For the Cyclades, maximum prosperity probably occurred earlier in synchronization with the Siphnians' peak output of gold and silver ore, *i.e.* just prior to 500 and the arrival of Persian conflict in the Aegean.

[1081] Ober 2015, Fig. 1.1.

# 5 Analysis of Economic and Social Development

## 5.1 Introduction

With the evidence from the site analysis in Chapter 4 and the trade route observations in Chapter 3, we are now prepared to answer the question, how the Cycladic Islands developed economically and socially between 1000 – 480. The archaeological evidence clearly indicates that some islands pursued economic activities that went beyond their base agricultural economy (as broadly defined). Evidence of mining and quarrying is the most prominent but was not the only additive activity seen. On other islands the evidence for additive activity is not compelling. The additive economic activity would seem to explain in large measure the economic development seen in the Iron Age Cyclades. The Delian League tables help frame the analysis on an island by island basis, but only to assist, the primary evidence remains the observable material culture. In Chapter 5, we summarize the archaeological evidence of additive economic activity, examine comparative economic growth between individual islands, discuss the observable stages of social development, place Cycladic development within a larger context, and examine evidence that suggests additive economic growth was an applied human strategy.

## 5.2 Summary of Archaeological Evidence

A brief summary of the archaeological evidence for economic activity that was additive to the base subsistence economy as well as noting on which islands no evidence of additive activity was found is presented below in the same order as the site reports:

**Keos**: The closest island to Attica and the mines at Lavrion, Keos had evidence of smelting of Lavrion silver ore from the Late Bronze Age at Ayia Irini. Survey work indicated a network of farmsteads in the rural landscape that may have been involved in extending agricultural production perhaps through terracing. Waste piles of Parian

marble at Karthaia suggest crafts skill development in marble working. Artisans may have plied their trade abroad as evidence of Cycladic craftspersons working marble outside the Cyclades is considerable. Mining iron ore and *miltos* is evident in the archaeological record and confirmed in later epigraphic evidence.

**Kythnos**: Early Cycladic copper smelting is evident at Skouries. Iron Age smelting activity at Vrykastro is evidenced by finds of slag, tools, and waterworks. Finds of Egyptian, Near Eastern, and western Mediterranean artefacts at the adyton of an Archaic temple on the middle terrace may indicate trade activity.

**Seriphos**: Iron mining activity from the Hellenistic period is evident but these resources seem not to have been exploited in the Iron Age.

**Siphnos**: Silver and gold mining from a network of mines concentrated in the north and south of the island is evident. Smelting activity evidence seems less than the amount of ore extracted would suggest, indicating the Siphnians may have exported their ore.

**Melos**: A range of mining activity is evidenced at Melos. Alum, Kaolin, Pumice, and Obsidian were all mined and exported. Large scale ceramic production is evident near Kambos. Ceramics from Melian fabric have been found at Tocra.

**Kimolos**: Kaolin mining at the northeast of the island is evident.

**Paros**: Marble quarrying from the mid-7$^{th}$ century is evident. Parian marble is found exported over a wide area. Craft expertise in both quarrying and marble carving were exported. Parian ceramics have a broad distribution, including finds at Al Mina and Naucratis.

**Naxos**: Marble resources were exploited from the early 7th century as well as the hard-abrasive emery. Naxos was also rich agriculturally and probably exported some agricultural products, with wine mentioned in the literary record.

**Donousa**: Locative aspects along the east to west trade routes may have created an opportunity for harbour fees or services but there is no hard evidence of this.

**Andros**: The evidence of outside contact in the Early Iron Age is almost all Euboean. The move to Palaeopolis and the building of a harbour mole there suggests the Andrians were capturing some economic benefits from ships stopping, either via taxation, harbour fees, or the selling of services such as victuals or water. Iron-ore mining activity in the north of the island post-dates the Iron Age.

**Tenos**: No specific activity can be identified based on current information.

**Mykonos**: No evidence of additive economic activity.

**Thera**: Mining activity on both Thera and Therasia post-dates the Iron Age. Thera does seem to have been an important node in the trade route from the Saronic Gulf, through Thera, to eastern Crete and on to North Africa and Egypt as evidenced by ceramics.

**Anaphe**: Attracted pilgrims to the sanctuary of Apollo Aigletes but the earliest preserved evidence post-dates the Iron Age.

**Amorgos**: No evidence of additive economic activity.

**Ios, Sikinos, Folegandros**: All have no evidence of additive economic activity.

**Rhenia**: May have had activity in support of Delos.

**Syros**: No evidence of additive economic activity.

**Lesser Cyclades**: No evidence of additive economic activity.

The summary indicates that some islands did adopt additive economic practices over the course of the Iron Age, and some did not.

## 5.3 Intra-Cycladic Analysis

Mathematically, the relationship between population growth and economic growth was presented in Chapter 1. If a community cannot produce more goods and services than it requires, and still must pay *phoros,* that community, or a portion of it, suffers a decrease in lifestyle. At some point, the group cannot make the requested payment. Alternatively, a high *phoros* can only be made by a community that over the long term is producing more in goods and services than is required for its own subsistence. As discussed, and with a full appreciation of the caveats of applying the levels of tribute as economic indicators, the assessments of the Delian League allow us to approach a relative island by island analysis of growth within the Cyclades.

Renfrew utilized the *phoros* tables to validate Melos's increased economic output as it shifted from what he termed mode I (no political centralisation, subsistence level economic output), to mode II (an independent state polity), to mode III (a subordinate unit within a larger system).[1082] Renfrew described Melos's transformation from a mode I to mode II polity between 1100-700. Melos remained a Mode II entity from 700, throughout the Archaic and early Classical period, down to 415 when Athenian domination took over. In Renfrew's analysis, the contributing factors in the transition from mode I to II was an intensification of the agricultural production processes that created a surplus of food by which support for non-food producing administrative and

[1082] Renfrew 1982b, 264, Table 20.1.

specialist functions was achieved.[1083] Renfrew regarded the *phoros* amount of 425/424 as close to the maximum amount the Melian economy could produce beyond the amount required for subsistence (what he termed PBS, production beyond subsistence).[1084] He then attempted to quantify the PBS needed to pay the *phoros* by calculating how much wheat that amount of tribute silver would purchase.[1085] Renfrew concluded a working population of 2,000 to 3,000 would have been required to produce the wheat surplus needed to meet the tribute obligations. Renfrew considered only Melos and concentrated his analysis on the intensification of agriculture.

As discussed, the term additive economic strategy as developed is preferred to Renfrew's PBS. Renfrew's term just addresses the first word, additive, in the preferred term additive economic strategy, i.e. the economic developments were additive to the base subsistence economy. The term, economic, purposely highlights that these decisions were clearly economic, meant to produce additional goods and services that could be exchanged for material gain. Lastly, strategy, emphasizes the human agency of these developments. It was a human plan to take advantage of the natural resources, geographic position, and new technologies. It was an applied, practical strategy.

The examination put forward in this thesis considers any additive economic activity, mining, quarrying, trade, construction of harbour facilities as examples, in its analysis. This allows for consideration of additive practices that may have been undertaken on

[1083] *Ibid.,* 265, 271-5.
[1084] *Ibid.*, 277.
[1085] *Ibid.,* 277-9, Table 20.3.

islands without sufficient arable land to allow the intensification of agricultural production such as Siphnos and Ios.

The archaeological evidence summarized above highlights which islanders developed more economic activity than others. An analysis of the Delian League tribute lists coupled with the agricultural area of each island suggests an explanation for the divergent outcomes. Tables 1 is repeated for convenience.

As mentioner in Chapter 1, the *phoros* tables as markers of economic output need to be used with caution. The potential for Athenian political manipulation of the assessments cannot be ignored. Friends may have been rewarded with lower assessments and dissidents punished with higher. Additionally, the 425/424 assessment comes about 75 years after the period under examination which raises the possibility that during that interval conditions may have changed. Notwithstanding these precautions, arguably the Delian League assessments may give us a relative, but not absolute, measure of each island's populations ability to generate wealth. The material remains suggest that Sikinos, Folegandros, and Mykonos could not have produced the 30 talents of *phoros* that Paros did under any Athenian political machinations.

Table 1 Selected Data on Cycladic Islands, after Renfrew 1982b, Table 20.2 with additional information.

**Sorted by Assessment**

| Island | Total Area (km²) | Farming Area (km²) | Pct. Arable Land | Highest Point (masl) | Assessment 425/4 in Talents | Assessment per Farming Area (T/10 km²) |
|---|---|---|---|---|---|---|
| Paros | 212.8 | 61.0 | 29% | 771 | 30 | 4.92 |
| Andros | 377.9 | 33.1 | 9% | 997 | 15 | 4.53 |
| Melos | 159.2 | 19.5 | 12% | 748 | 15 | 7.69 |
| Naxos | 412.4 | 98.3 | 24% | 999 | 15 | 1.53 |
| Keos | 153.8 | 49.8 | 32% | 562 | 10 | 2.01 |
| Tenos | 196.3 | 41.1 | 21% | 729 | 10 | 2.43 |
| Siphnos | 75.0 | 13.3 | 18% | 682 | 9 | 6.77 |
| Kythnos | 91.2 | 27.0 | 30% | 355 | 6 | 2.22 |
| Thera | 83.7 | 45.6 | 54% | 567 | 5 | 1.10 |
| Amorgos | 130.0 | 11.3 | 9% | 823 | 2 | 1.77 |
| Mykonos | 86.6 | 15.8 | 18% | 373 | 2 | 1.27 |
| Seriphos | 75.0 | 8.3 | 11% | 583 | 2 | 2.41 |
| Ios | 121.5 | 6.0 | 5% | 714 | 1 | 1.67 |
| Syros | 85.2 | 24.3 | 29% | 442 | 1 | 0.41 |
| Folegandros | 33.1 | 4.4 | 13% | 416 | 0.333 | 0.76 |
| Sikinos | 41.7 | 2.3 | 6% | 549 | 0.167 | 0.73 |

The islands have been grouped into three categories based on the level of their tribute payments, high, low, and others:

High: islands with an assessment of five or more talents: Paros, Andros, Melos, Naxos, Keos, Tenos, Siphnos, Kythnos, Thera.

Low: islands with an assessment of two or less talents: Amorgos, Seriphos, Ios, Folegandros, Sikinos.

Others: for whom the evidence is unclear, Mykonos and Syros.

The low group has a significant commonality; farming area is 11.3 km² or less on each of the islands in this group. Hypothetically, the amount of food that could be produced from 11.3 km² or less did not support a population large enough to create a labour pool free to do things other than produce food. There was probably some craft specialization within the work force but not on a significant scale. Melos and Siphnos had small amounts of farmland on them but were both rich in mineral resources. On Siphnos, once the mines had been played out, the island economy dropped into the level of the low achievers.

The high group (other than Melos and Siphnos) ranged from nearly three times up to ten times the farming area per island as the low group. The larger area of productive farmland seems a pre-condition to some level of labour specialization. The islanders in this group pursued a variety of additive economic strategies as discussed.

While we cannot determine the land area under cultivation over 2,400 years ago with the suggested degree of precision, what is important is the relative position of the low and high groups in arable land. As long as the ratios are close, the integrity of the analysis is sound. The divergence between arable land of the two groups is several orders of magnitude, it is not just a few acres.

In the Other category, Syros and Mykonos are both over the 11 km² of farmland threshold but do not seem in either case to have adopted an additive economic strategy. Why they did not is unclear. Syros is particularly vexing as discussed. Tenos, while categorized as high, is also troubling (see discussion in section 4.4.2.3). The archaeological record attributed to the Archaic period is concentrated in the small area of Xobourgo. The lack of evidence for additive economic activity at Xobourgo makes explaining the *phoros* of ten talents and the contribution of ships at Salamis (Hdt. 8.82) challenging. It seems likely that this is an issue of the archaeology; there was more going on economically on Tenos than archaeology has so far provided

evidence for. As discussed in the site report, current new discoveries and the unexcavated acropolis area are intriguing.

The calculation of arable land can be contextualized by converting it into farm sized units.[1086] Aristotle implied that a twelve-hectare farm was the ideal size, large enough to support a yoke of oxen and a labourer (either free or slave) in addition to the principals. According to Aristotle, a five-hectare farm was too small to support a labourer.[1087] Converting 11.3 km² to hectares, gives 1130 ha, divided by 12 ha equals 94 farms. If we then consider five able bodied workers per 12 ha farm, we get a total workforce for the 94 farms of 470 people (not counting those too young or old to contribute a full-time equivalent amount of labour).[1088] Speculatively, this level of working population is too small to free labour for other activities or allow much craft specialization. If we do the same calculation using five ha per farm with 3 full-time labourers per farm, the total working population is 678 people.[1089] In contrast, the average arable land of the nine high category islands (including smaller Siphnos) is 43.2 km², or 43,200 ha, supporting 3,600 farms per island at 12 ha per farm, 18,000 people per island at 5 per farm. A population of 18,000 full-time equivalent labourers probably would provide labour for non-farm activities additive to the base agricultural economy.[1090] Again, it is the relative comparison of the number of farms and

[1086] See Nagel 2006, 31-2 on the household as the foundational unit of Aristotle's *polis*.
[1087] Nagel 2006, 70-71, 83, 130, 312.
[1088] Renfrew 1982b, 278 Melos required 2,000-3,000 workers to produce its surplus.
[1089] Hesiod *Opera et Dies*, 404-7. "You'll need a woman and an ox to start a life: A ploughing ox, bondswoman not a wife, one who can follow oxen, and prepare the household's needs and management with care." Suggests the smaller farm size, trans. by A.E. Stallings.
[1090] Scullard 1975, 53 makes a similar case that the minimum *heredium* of two *iugera* plus access to the *ager publicus* for grazing land was not sufficient to support a family in Early Rome and was one of the underlying issues in the Struggle of the Orders.

population per the low and high categories that is important, not the absolute number.

In Chapter 1, the examination of Table 2 showed that farm area and *phoros* payment levels were not highly correlated. After the island by island examination of the archaeological data in Chapter 4 we can add a codicil to the observation: while *phoros* and farm area are poorly correlated, the evidence does imply that a minimum threshold of agricultural activity was needed before additive economic practices could be pursued.

The range of outcomes and evidence of different strategies underscores the necessity of examining the full scope of available evidence rather than a subset which could lead to a skewing of interpretation based on the sites selected.

## 5.4 Social Development

Scheidel suggested that institutional innovation coupled with a favourable climate regime had to converge to create conditions conducive for both population and economic growth. He noted two such convergences had occurred; in Crete *c.* 2000 with the creation of the Minoan palace based economy and again throughout Greece after 800 with the development of the devolved authority citizen *poleis.*[1091] The material evidence for the steps towards devolved authority in the Cyclades is limited and challenging to interpret. We know the chronological end points of the few small size Protogeometric settlements and the more abundant and larger Archaic *poleis* settlements, but the evidence of the transition between the two is preserved at just a few sites and is incomplete at that. Two types of diachronic evidence are illustrative

[1091] Scheidel 2004, 743-5. Scheidel labeled the Palace system redistributive, an aspect argued against in Chapter 3.

of social development: cult architecture and burial practices. Evidence of cult architecture in the Cyclades is more prevalent than is the burial evidence.

In the Cyclades, cult facilities evolved from hypaethral altars as seen at Koukounaries and Yria found first in association with Late Bronze Age pottery and carrying through to the 9th century. In the Early Geometric period, simple one room shrines were built proximate to altars at both sites, followed later in the 8th century with remodelled larger structures capable of hosting communal feasting activities. These in turn were replaced with grand marble temples in the 7th century.[1092] In the case of Koukounaries the site was abandoned in the mid-7th century and a marble temple was later built in Paroikia. At Minoa, the pre-oikos of the Naxians on Delos, Sangri, and Xobourgo, later temples or walls were built over earlier structures partially obscuring evidence of earlier pyre pit ritual activity. Monumental structures incorporating communal dining spaces can be found on Anaphe, Andros, Delos, Keos, Kythnos, Melos, Naxos, Paros, Siphnos, Tenos, and Thera. The cult sites followed a pattern of development from simple outdoor worship, to communal buildings often associated with feasting activities, to larger edifices supported by the community at large.[1093]

Continuous burial evidence from the Late Protogeometric through to the Archaic is restricted to Grotta on Naxos, Xobourgo on Tenos, and Minoa on Amorgos (see sections 4.3.3.2 on Grotta, 4.4.2.2 on Xobourgo, and 4.5.4.2 on Minoa).[1094] Lambrinoudakis, Kourou, and Marangou have interpreted the burial phases and social

[1092] On Koukounaries see Schilardi 2016; Gounaris 2005; On Yria see Charalambidou 2017.
[1093] See Charalambidou 2018; Schilardi 2016; Kourou 2015, Lambrinoudakis 2004; Marangou 2002b for discussion on social development supported by burial practices and cult architecture..
[1094] On Minoa see Marangou 2002b; On Grotta see Lambrinoudakis 2004; 1988; on Xobourgo see Kourou 2015; 2011.

ramifications similarly.[1095] The earliest burials are simple cist graves or pyre pits containing interred or cremated remains sometimes with grave goods consisting primarily of pottery. These have been interpreted as family units. Later, these cist graves are incorporated within enclosure walls which suggested to the excavators a larger social unit, the clan, had replaced simpler family practices. In a third phase, pebbled terraces often incorporating seating areas or an eschara suggesting a yet larger unit, perhaps the community as a whole. Large burial rings of orthostats are seen only at Late Geometric Tsikalario. These seem to have been enclosures built on a grander scale than elsewhere in the Cyclades. Finds from Tsikalario cist grave 11 were simple grave goods (see Fig. 4.72).[1096] Simple grave goods continued to be associated with burials throughout the Cyclades.

The development of communal dining spaces in cult structures as seen at Koukounaries and Yria or in burial contexts such as at Grotta and Xobourgo are socially significant. Shared dining is an important part of creating a sense of community and the individual's place within a society.[1097] Food can be interpreted as the glue that holds together cultural relationships and provides a sense of cultural identity as seen in the holiday Turkey dinner in the UK and US or serving unleavened bread at a Passover *seder.* Hastorf suggests that food sharing is probably the most common social act in human history.[1098] The development of communal dining spaces preserved in the Cycladic material record at multiple sites during the Geometric

[1095] Lambrinoudakis 1988 presents the most compelling description.
[1096] Charalambidou 2018, n13 described the metal finds from Tsikalario as a piece of a silver ring or earring as well as few pieces of iron, probably knives or swords. The majority of the finds are domestic coarseware.
[1097] See Hastorf 2018; Dietler and Hayden 2001.
[1098] Hastorf 2018, 4.

period marks a significant step in the development of broader community bounds beyond simple family associations.

The composition of burial goods is noteworthy. It must be noted that we may be missing elaborate burials in the archaeological record. As mentioned, the Phaneromeni cemetery on Melos was looted as were the graves at Tsikalario.[1099] The Delian burials moved to common pits on Rhenia during two purifications, removed items from their original contexts and mixed the contents into an indiscriminate mass. This may have obscured the association of elaborate grave goods with their original burials. While most Cycladic Iron Age burials seem not to have been ostentatious, the record could be missing some evidence that suggests more social stratification existed.

That being said, the observable Cycladic burial record lacks an obvious distinction between elaborate burials with jewellery and weapons and more common burials.[1100] Even the polyandria warrior burials from Vitzi on Paros were not accompanied by ostentatious goods.[1101] This differed from certain mainland and Cretan practices.[1102] Rich burial finds from Lefkandi (especially the Toumba cemetery), Teke at Knossos, and Athens have been interpreted as 'elitist' and as harbingers of social conflict.[1103] The social conflict has been interpreted as a result of changing relationships during the Geometric period between land owners and labour which produced economic

[1099] Charalambidou 2018, 151.
[1100] Murray 2017, 8-9.
[1101] Zafeiropoulou 2018, 65-71, Figs 2-6; Kourayos 2018c, 284-87, Figs 8, 9; Agelarakis 2017; Kourayos 2015, 37; Schilardi 2002, 239-240.
[1102] Kamen 2013 on status in Classical Athens.
[1103] On Lefkandi see Lemos 2002; 1996; Thomas and Conant 1999; on Teke see Kotsonas 2006, 159-61; on Crete generally see Wallace 2014; 2010; on Athens see Bohen 2017; Morris 2007; 1987.

winners and losers.[1104] The Athenian literary record of Solon being brought in to 'solve' the social conflict has cast a large shadow over the interpretation of the Archaic period's social development and how the *polis* structure developed in part as a response to social pressures.[1105] Raaflaub suggested that social conflict was the catalyst for social change in late 8th and 7th centuries. He noted three instances of social ruptures in Athens that required political intervention to reset the societal balance; first the land conflicts addressed by Solon, then Cleisthenes after the Pisistratids had reignited societal conflict, and lastly Ephialtes and Pericles partly in response to the use of lower classes in the Athenian navy and their incorporation into social decision making.[1106] Van den Eijnde suggests it was aristocratic clans pursuing their own agendas that were the driving force in Athenian development. Pisistratus's purification of Delos was designed to build his personal authority.[1107] The Athenian braggadocio stands in contrast to the Naxian dedications at Delos which were done as a collective rather than by wealthy individuals.[1108] The Athenian conflicts are recorded in the literary record and to a degree in the burial record.[1109] Snodgrass noted a dichotomy in scholastic opinion on the degree of social discord in the Iron Age; those arguing for social stratification tended, generally speaking, to be historians working with the written record and those who saw a more egalitarian society tended

[1104] Murray 2017, 9; Langdon 2008, 10, 33-7 on imagery in mainland Geometric art focusing on male social competition.
[1105] See Leão and Rhodes 2016; Wallace 2007; Andrews 1992, 371, 377, 387-9.
[1106] Raaflaub 2007, 16.
[1107] Van den Eijnde 2020, 54, 63, 71-3.
[1108] Fullerton 2016, 24; Osborne 2009, 197.
[1109] Rose 2012, 47-8, 63n14; Wallace 2007, 49-50 on lavish Eupatrids' burials; Morris 1987 on exclusion of some elements of society from burial grounds in Athens.

to be archaeologists.[1110] Lemos emphatically stressed the social tranquillity of the Protogeometric record.[1111]

The Cycladic record does show eventual development of a *polis* system on each island, this is clear.[1112] What the Cycladic record is lacking though is evidence of the dichotomy between elaborate and simple grave goods. This may be suggestive of relatively less social tension within Iron Age Cycladic society than occurred on the mainland. If there was less social tension, this may have facilitated expeditious economic development of large projects like mines, harbour facilities, and related infrastructure.

The construction of fortification walls is a physical manifestation of communal organization. Early and Middle Geometric fortification walls are evident at Hypsili, Zagora, and Vathy Limenari.[1113] Longer circuit walls encompassing an entire *asty* date to Late Geometric/Early Archaic periods at Paroikia, Chora on Naxos and Siphnos, Ancient Melos, Palaeopolis, Vrykastro on Kythnos, Thera, Minoa, and at Koressos as well as other islands. These projects suggest communal activity and were recognized as such in ancient sources.[1114] Unfortified habitation sites as seen in Thessaly are considered more tribal, an *ethnos*, rather than a *polis* in which authority has been

[1110] Snodgrass 1987, 35. See also Morris 2005, 96 on this dichotomy; Haggis 1999, 305-7 cautioned that if the archaeological record does not demonstrate hierarchical patterns, the interpretation can cover the gamut from unstable and disordered to overly simple and egalitarian which leads to contradictory conclusions; Raaflaub and Wallace 2007, 22-48 argue for increasing egalitarian social norms in the Archaic period; Cartledge 2007, 156 made the pertinent observation that the discussion of social stratification needs to consider a broader framework than just Athens. This seems particularly relevant for a discussion focused on Cycladic development, and not Greece more widely.
[1111] Lemos 2002, 191.
[1112] Reger 2004, 450-92; 1997.
[1113] On Hypsili see Fig. 4.93; Televantou 2012, 38; On Zagora see Fig. 4.92; Cambitoglou 1981, 23; On Vathy Limenari see Fig. 4.83; Louyot 2008, 253-4.
[1114] Hdt. 1.96, 5.98; Thuc. 1.10, 3.94; Aristotle *Poetica* 1448a.36; *Politica* 1261a.28.

devolved to non-family members.[1115] The epigraphic evidence of *polis* formation was presented in the site reports, the communal construction of fortifications furthers the point.[1116]

The discussion on egalitarian or stratified social conditions focuses on the internal development of the *polis.* Another notable difference between Iron Age Cycladic development and Mainland Greek and Cretan development was the lack of evidence in the Cyclades of armed conflict between *poleis.* Other than the literary record of conflict between Naxos and Paros in the late 6th century, intra-island and intra-*polis* conflict is not part of the Iron Age Cycladic record. Hypothetically, this is due to the nature of islands compared to larger landmasses with shared and indeterminate political borders.[1117] There is no dispute over where an island starts and stops, at the shore.[1118] Where Attica ends and Megara starts though is an open question, subject to dispute.[1119] Crete is large enough (see Appendix C, section 9.1) that territorial disputes between *poleis* were common.[1120] War with neighbouring groups was a part of the warrior-ethos of rulers seeking validation.[1121] By the 8th century, disputes over land had become destructive; the elimination of Lefkandi in Euboea and Melie in Asia Minor being prime examples.[1122] In addition to territorial skirmishes, control over trade routes and the ability to extract taxes from trade activities would have added to the disruption.[1123] The Cycladic islanders seem to have been spared these conflicts

[1115] Papadopoulos 2014, 186-7; Hall 2014, 90-4.
[1116] Reger 2004; 1997.
[1117] Constantakopoulou 2005 on island identity.
[1118] DiNapoli and Leppard 2016, 157-8 on islands as discrete landscapes; Dawson 2014, 22-4.
[1119] Lyttkens 2013, 34; Raaflaub and Wallace 2007, 27; Hanson 2000, 27-39.
[1120] Viviers 1999; Boardman 1992, 227, 230.
[1121] North 1981, 27-8.
[1122] On Meliac War see Mac Sweeney 2017, 394-5.
[1123] Lyttkens 2013, 40-2.

for the most part. Documented conflict is limited to the period around the tyrants (525-500) with the ransom on Siphnos and the siege of Naxos by Aristagoras and the Persians.[1124] Not that intra-island relations were always peaceful, the Parian Archilochos was killed by the Naxian Corax.[1125] Competition between Naxos and Paros was speculatively over access to trade routes or perhaps control of Delos and were not attempts to conquer one another.[1126] The construction of fortification walls suggests that there were issues, perhaps with raiders.[1127] Freedom from the near continual warfare between *poleis* seen on the mainland would have preserved resources, both human and material, for uses other than war. How considerable a factor this was seems impossible to quantify, but it must have been a benefit in helping to create an economic surplus. Moreover, the Cycladic islanders were commercially focused with goods for sale. As one example, Athens was able to get all the *miltos* from Keos by contract, there was no need to resort to violence for the Athenians to get what they desired from the Keans.[1128]

## 5.5 Comparative Economic Growth

This brings up the question of how Cycladic growth in the Iron Age compared with growth elsewhere in Greece and across the broader ancient world.[1129] Morris argued that living standards in Greece doubled between 800-300 with both extensive aggregate economic growth and modest per capita economic growth having

[1124] See sections 4.2.5.2 on Siphnos, 4.3.3.3 on Naxos.
[1125] LOEB 259 *Greek Iambic Poetry,* 24, 32, 38, 40.
[1126] Herodotus (5.31) and Diodorus Siculus (7.1) both wrote of the conflict between Paros and Naxos; see Kourayos 2018c, 280-1; Kourayos, Angliker, Daifa, and Tully 2018, 147-8 suggests competition/disputes over Delos; Kourayos and Daifa 2017, 316-17.
[1127] Mazarakis and Leventi 2013, 213 on sea raiders.
[1128] Rutishauser 2012, 136-7; Cherry, Davis, and Mantzourani 1991a, 299-300.
[1129] See Manning 2018, 216-27 on issues associated with measuring growth in the ancient world.

occurred.[1130] He suggested this growth was demonstrated by an increase in square area of houses (see Fig. 5.1).[1131] Houses increased in size as well as comfort features (seen at the end of the period in some houses such as drains and plastered walls). Additionally, house size distribution clustered closely around the mean size (in 600, the 25th percentile house was 50 m² and the 75th percentile house 100 m²) suggesting to some an equalitarian wealth distribution. A closer look at the Fig. 5.1 shows that most of the growth in house size occurred between 600-400.

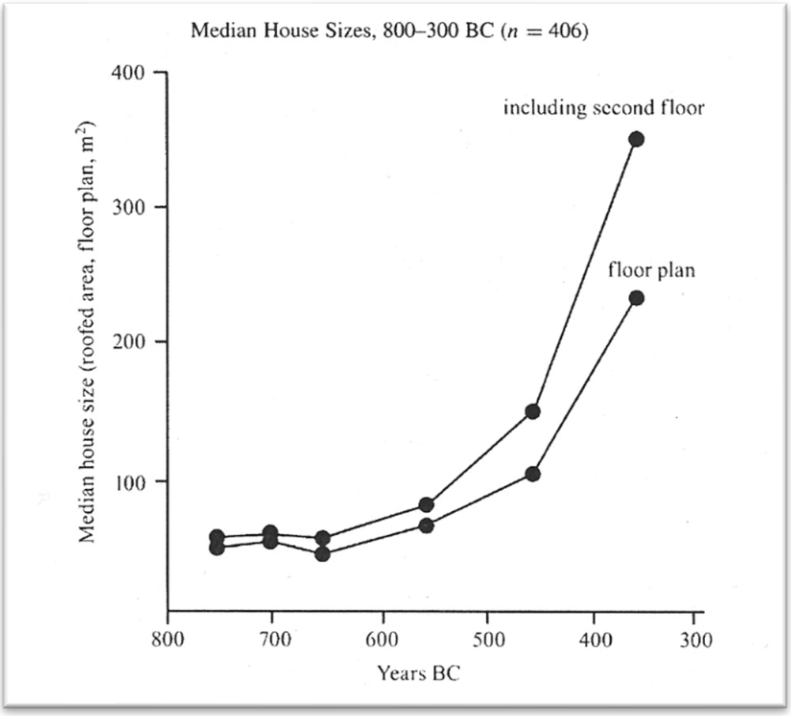


***Figure 5.1 House Sizes 800-300. From Morris 2004, Fig. 7.***

[1130] Morris 2007, 231.
[1131] Morris 2007, 226-30, Table 8.2.

Mediterranean wide proxy data taken from shipwrecks involved in trade and evidence of lead pollution in the Spanish lake of Penido Velho near the Rio Tinto mines (which represents smelting of silver bearing ore), suggest robust economic activity occurred over the larger scale starting about 700 (see Fig. 5.2).[1132]

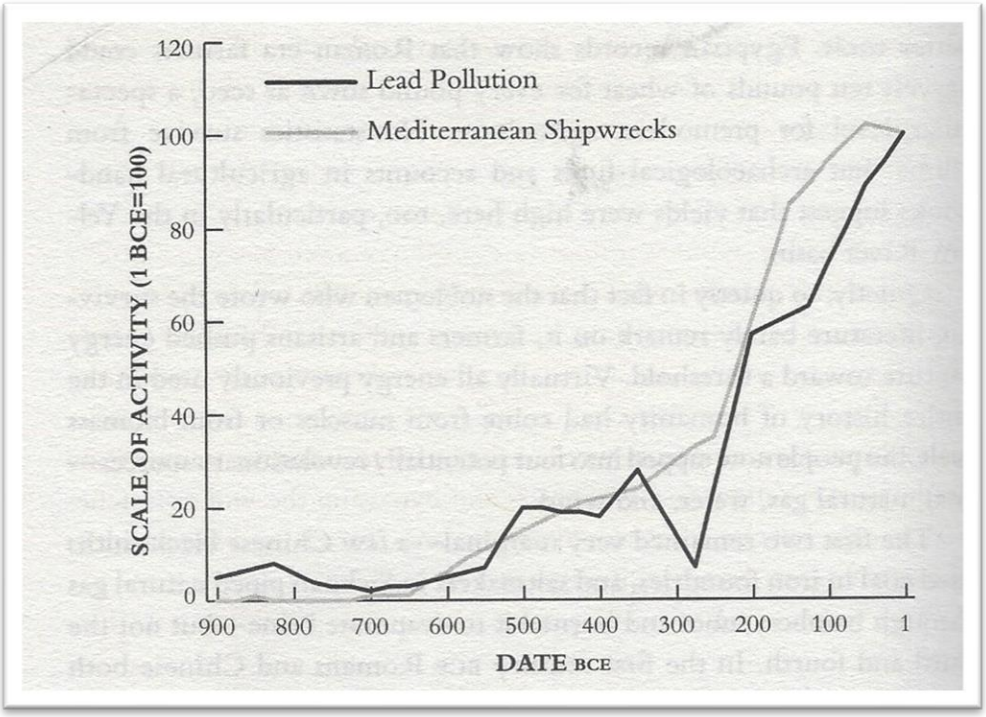


***Figure 5.2 The growth in shipwrecks and lead pollution from smelting activities across the Mediterranean. Data normalized so the curves overlap. From Morris 2011, Fig. 6.2.***

[1132] On shipwrecks see Wilson 2011, 33-9, Fig. 2.2; Morris 2011, 287-9. The data presented in Fig. 5.2 reverses in Late Antiquity clearly showing the decline in economic activity, see Morris 2011, 297, 309-12, Fig. 6.6. The data marking expansion and contraction of economic activity by these proxy measures seems robust.

In the Cyclades, the expansion of the number and size of settlement sites, the monumental architecture, evidence of non-agricultural economic activities on a host of islands, and the wide distribution of Cycladic ceramics in the eastern Mediterranean seems in keeping with the larger trends of rapid economic development in the early Archaic period evidenced by these proxy measures. Trying to calculate relative growth percentages between regions based on the data available seems an exercise in extreme speculation. The archaeological record on many of the islands suggests that Cycladic growth was in keeping with what was going on in mainland Greece.

## 5.6 Pursuing an Additive Economic Growth Strategy

Morris suggested several explanatory factors underlay the observable growth patterns for Iron Age Greece. As has been noted, he suggested the growth of population followed a change in climate *c.* 800 which created a better environment for agricultural productivity. The economic expansion is multi-faceted. Morris suggested technological advances in agriculture, basic tools, harbour facilities, mining and metallurgy changed, but not significantly. He argued they were extensions of existing knowledge. In his view, the driving changes were the bigger picture items of the alphabet and coinage, which together created a significant decrease in transaction costs making trade easier and more profitable.[1133] As has been noted, the major innovations of the alphabet and coinage both came through the Cyclades where the evidence suggests the islanders were early adopters of these new ideas. Morris goes on to suggest that more important than technical innovations, was the development of egalitarian male citizenship, most clearly demonstrated in Athens, and the

[1133] Morris 2004, 730-4.

establishment of common property rights embodied in the citizen-based institution of the *polis*.[1134] This created the situation where the benefits of added economic activity accrued to the individual or the broader community and not to an aristocratic palace minority as in the Late Bronze Age or to an autocratic potentate as in the hierarchical monarchic systems of the Near East.[1135] The development of a common understanding regarding property rights and the establishment of a broad franchise seems fundamental to pursuing additive economic activities.

In the Cyclades, the role of technological innovation was significant, more than an extension of existing technologies as Morris suggests.[1136] Cumulatively, they had dramatic impact, creating new processes, products, and finding new markets. The introduction of hard rock mining techniques and the invention of the heavy lift crane using multi-part block and tackle, have been discussed. The new technology allowed the marble industry on Naxos and Paros to begin and, as seen, it quickly expanded over a broad area distributing not only stone but craftsperson expertise as well. The development of transferrable artisanal skill in stone working is reminiscent of when Early Cycladic metallurgists took their resources and skills to Crete. Cognate with the marble trade was probably some advances in ship construction that allowed heavy stone to be safely transported.[1137]

The early adoption of coin minting in the Cyclades is additive to the discussion. Between 540-480 Delos, Karthaia, Ioulis and Koressos on Keos, Kythnos, Melos, Naxos, Paros, Thera, and Siphnos minted coins. Seriphos and Tenos may have as well

[1134] *Ibid.*
[1135] Macedonian king controlled and owned the natural resources of Macedonia including timber, silver and gold. See Karathanasis 2019, 709, n10.
[1136] See Temin 2013, 197 on importance of technological progress.
[1137] On ship construction see Mark 2005; Katzev 1987; Snodgrass 1983; Casson 1971.

but the evidence is less certain.[1138] In order to mint silver coins, one needs silver. The only Cycladic island with its own source of silver was Siphnos.[1139] All other coin minters would have had to acquire silver bullion elsewhere. To acquire silver bullion for minting, they would have needed to adopt an additive economic strategy in order to produce surplus goods that could either be traded directly for silver bullion or converted into revenue elsewhere to then be exchanged for silver bullion. Xenophon (*Oec.* 3.2) recognized this from the silver producer's viewpoint in that Athenians could attract a wide variety of goods in exchange for Lavrion silver.[1140] It is interesting that the islanders who did not mint their own coins in the Archaic period (Amorgos, Andros, Folegandros, Ios, Kimolos, Mykonos, Sikinos, and Syros) correlate closely with the low farm area group identified above, excepting Andros.[1141] The average farming area of the islands that minted coins was 44.8 km² while the average for the non-minters was 13.9 km². This suggests that the issuance of coinage is a marker of adopting an additive economic strategy much as the Delian League tribute assessment was.

Morris suggested that catching up, or convergence with the Near East created a kind of dialectic for growth in the Aegean. As evidence of the gap that had occurred between the Near East and the Greek Aegean he examined house sizes as discussed above. In the Late Bronze Age, house sizes in Greece, in the western Near East, and in

[1138] Sheedy 2006a, 51, Table 1, 3. The earliest minting of coins on Crete came later, after 470, about 70 years later than the first Cycladic series and after wide-scale Cycladic minting was taking place.
[1139] Sheedy 2006a, 19-20.
[1140] Xen. *Oec.* 3.2, ἐν δὲ ταῖς Ἀθήναις πλεῖστα μὲν ἔστιν ἀντεξάγειν ὧν ἂν δέωνται ἄνθρωποι, ἢν δὲ μὴ βούλωνται ἀντιφορτίζεσθαι, καὶ3 ἀργύριον ἐξάγοντες καλὴν ἐμπορίαν ἐξάγουσιν. ὅπου γὰρ ἂν πωλῶσιν αὐτό, πανταχοῦ πλεῖον τοῦ ἀρχαίου λαμβάνουσιν. But at Athens they have the opportunity of exchanging their cargo and exporting very many classes of goods that are in demand, or, if they do not want to ship a return cargo of goods, it is sound business to export silver; for, wherever they sell it, they are sure to make a profit on the capital invested. Trans. by E.C. Marchant.
[1141] Sheedy 2006a, 19-20.

Egypt were similar. In Classical Greece, houses sizes exceeded those in the Near East. Between 1200 – 700 though, Aegean house sizes shrunk by half of what they had been in the Late Bronze Age while Near Eastern house sizes remained the same as they were in the Bronze Age (see Fig. 5.3).[1142]

Table 8.2 *Median house sizes, mainland Greece and Aegean islands, c. 1600–300 BC*

| Period (years BC) | Sample size | Median area ($m^2$) |
|---|---|---|
| 1600–1400 | 11 | 40 |
| 1400–1300 | 14 | 41 |
| 1300–1200 | 50 | 76 |
| 1200–1075 | 19 | 52 |
| 1075–1025 | 2 | 71 |
| 1025–900 | 7 | 70 |
| 900–800 | 12 | 43 |
| 800–700 | 75 | 51 |
| 700–600 | 80 | 49 |
| 600–500 | 23 | 70 |
| 500–400 | 30 | 149 |
| 400–300 | 82 | 230 |

***Figure 5.3 Median House Sizes. From Morris 2007, Table 8.2.***

The dramatic growth seen in Greece between 800-300 was, in Morris's view, filling the void. This may have been the case, but it is only so if there is knowledge about the differential. You never know that your house is half the size of someone else's unless you see their house. Technological advances frequently come from seeing how someone else has approached a problem and coming up with a different solution.

[1142] Morris 2004, 728-9.

Absent an exchange of ideas, we tend to think that our way is the best and only way. The geographic location of the Cyclades and the shift in Iron Age trade routes is critical in this regard. Cycladic islanders were in Al Mina and Naucratis. They had exposure to ideas, technologies, and methods of exchange from the late 10th to early 9th centuries onwards. Moreover, acknowledging that equating pots with people can be misleading, the Cycladic finds at Al Mina predate Euboean, Corinthian, and Athenian.[1143] Cretan material is never found at Al Mina. This suggests that certain islanders had an entrepreneurial bent to some degree. [1144]

From a 21st century perspective, the idea of doing more seems the normal course for human behaviour. However, the proper perspective is not from a retrospective viewpoint but rather to travel back into the minds of 9th and 8th century individuals who have never experienced additive economic practices. For them, these thoughts are something entirely new, an idea of which they, centuries removed from the Late Bronze Age, have no prior experience with. It was a novel way of thinking. Moreover, for an environmentally fragile island ecosystem, that people moved beyond subsistence should not be surprising. It was a risk minimizing approach. The low rainfall in the Cyclades made subsistence farming precarious (see Fig. 4.2). The societal interest in building a buffer through networks of exchange seems a reasonable strategy.

[1143] Vacek 2017, 49.

[1144] Gilles 2018, 35-7 on entrepreneurship and economic development; Tandy 2018 on the role of the individual in colonization; Lyttkens 2013, 10-11, 19-20 discussed the role of the individual and how individual decisions were the underlying force behind economic structures but did not precisely address the concept proposed here that it is the individual decision to produce more than was required for subsistence to start or kick-off an additive economic adventure; Pedley 2006, 31 on the selection of an individual leader in the founding of colonies; North 2005, 17 wrote “the ubiquitous drive of humans to invent and innovate even in the absence of institutional incentives.”

Pursuing an additive strategy could be as simple as an individual deciding to plant more olive trees or grape vines to intentionally produce products in excess of what the individual needed for their comfortable subsistence. It could also be a collective decision to undertake larger projects. To illustrate the complexity, consider the steps involved in opening a marble quarry on Paros in the mid-7th century. Three phases will be discussed: extraction, transportation, and marketing.

Extraction involves finding quality stone and developing some system of property rights to identify who the stone belongs to; an individual, a group of individuals, or perhaps the entire community. We do not know who owned or controlled access to the marble on Paros.[1145] On Siphnos, it seems the silver mines were publicly owned as were the mines in Attica.[1146] The establishment of property rights suggests a complex social structure had to be in place. A supply of labour (energy) and some system of compensation had to be arranged, as well as the provision of capital goods in the form of metal tools, ropes, pulleys, sledges for dragging or carts for rolling extracted stone on, oil for fuel and the fabrication of lamps if working underground, and craftsperson expertise in the guise of stone workers to direct labour, and an overall administrative function.[1147] Tools, ropes, and carts all suggest the acquisition of metal ore, charcoal, smelting facilities, skilled craftspeople for metal working, rope

[1145] Rutishauser 2012, 136.

[1146] On Siphnos see section. 4.2.5.2; Hdt. 3.57 on common division of profits from mines; On Attica see discussion in Paros section 4.3.2.4; Aristophanes *The Wasps* 650-668 "Add to that the revenue from taxes, percentages, deposits, the mines, market and harbor dues, rents and confiscations…"; Xenophon *Ways and Means (De vectigalibus)*, 11-13 on Athenian state ownership of mines; Healy 1978, 103-12.

[1147] Hochscheid 2015, 126 on quarry workers being both free and slave; Sturgeon 2006, 33-4 suggests that quarry workers were free skilled craftspeople, not slaves; Temin 2013, 212-3 skilled labour, investing in education to create social capital.

making, and carpenters.[1148] Every step in this process had multiple layers of complexity, just consider all the pieces that must come together to produce a simple iron chisel or pry bar for moving rock.

Transport involves multiple steps to move the extracted stone from the quarry to the customer; land transport from the quarry to the seashore, ocean transport, and transport on land at the receiver's end. Transport up and down steep slopes was probably done on sledges using rollers or rock chips to reduce friction with mechanical energy applied to the sledge via multi-part block and tackle systems.[1149] On more level ground, carts drawn by animals could have been utilized. This implies harnessing systems and access to a range of building materials and carpentry skills for the building of carts, axels, and wheels capable of carrying heavy loads. Roadways would need to be built. Suitable ocean transport would be required for overseas carriage. Moving the monolithic 34.32 metric ton statue base from Naxos to Delos implies a significant vessel, much larger than the approximately fifteen ton displacement of the Late Bronze Age Uluburun wreck.[1150] Recent work examining rope channel grooves in building stones from Corinth and Isthmia, suggest large lifting cranes were in use from the mid-7th century.[1151] Pierattini credits the invention of the crane with the birth of Greek monumental architecture but it also explains how large blocks of stone could

[1148] Korres 2001 has a full description of the large array marble working tools and advances in alloys. He argues that the alloys used in ancient tools were superior for stone working than what artisans have available to them today; see also Palagia 2006, 244, 247-60, Fig 78 replicas of tools.
[1149] See Fig. 3.9 fresco from Akrotiri, block and tackle system to control the upper yardarm is clearly visible.
[1150] Tomlinson 2010, 139; Snodgrass 1983, 22 estimated that annually a minimum of 270 tons of sculptured marble moved around the Aegean in the Archaic period, mostly in ships, the largest single piece known to have been transported was the base of the Colossus of the Naxians on Delos *c.* 600, 5.14 m by 3.47 m by 0.71 m = 12.66 m² about 34.32 metric tons. This suggests a ship with at least 50-ton displacement; Uluburun see Pulak 2010.
[1151] Pierattini 2019.

be loaded on and off ships from this period forward.[1152] Land transport at the receiver's end is the same as at the loading stages, including having to carry the stone up slopes onto attractive building sites such as the Acropolis of Athens or at Delphi, both sites with multiple finds of Parian marble.[1153]

The wide distribution of Parian marble and evidence of Parian craftspeople working at building sites throughout the Mediterranean, indicates a complex business model was developed.[1154] There is almost enough evidence to suggest that Parians offered clients a turn-key temple building operation: they would supply the stone and the expertise, the customer only needed to provide the building site and the Parians would do the rest.[1155]

This quick overview suggests a conceptually simple task such as selling marble is in fact an extremely complex undertaking involving a combination of technologies, legal or transactional procedures, and the application of skilled and unskilled labour in quantity.

The notion that these additive practices start from individual decisions has survived in ancient literature.[1156] Homer described when the shipwrecked and destitute Odysseus finally arrived at the halls of King Alcinous, he was upbraided by Euryalus, one of the King's sons, for being a lowly trader:

[1152] Hochscheid 2015, 139-41 on ship loading technique and land transport.
[1153] Gruben 2010, 128, 138; Pedley 2006, 138-40, Fig. 74; Snodgrass 1983, 19; Wycherley 1978, 69, 274-5.
[1154] Rutishauser 2012, 25-6.
[1155] See Hochscheid 2015 141-2 on Parian business model.
[1156] Ulf 2013.

> οὐ γάρ σ᾽ οὐδέ, ξεῖνε, δαήμονι φωτὶ ἐίσκω ἄθλων, οἷά τε πολλὰ μετ᾽ ἀνθρώποισι πέλονται, ἀλλὰ τῷ, ὅς θ᾽ ἅμα νηὶ πολυκλήιδι θαμίζων, ἀρχὸς ναυτάων οἵ τε πρηκτῆρες ἔασιν, φόρτου τε μνήμων καὶ ἐπίσκοπος ᾖσιν ὀδαίωνκερδέων θ᾽ ἁρπαλέων·
>
> No stranger, you do not seem to me to be a man skilled in athletic games, such as among sophisticated men, but like one traveling far and wide with his benched ship, is a captain of sailors who are merchantmen, who keeps close watch on his cargo, and the gains of his greed. (*Od.* 8.159-164.)

This passage suggests that traders, working for their own account, were not atypical. Hesiod (*Op.* 618-32) described a landowner protecting his ship for the winter, then when the sailing season returned, loading his goods aboard a small vessel and trading them along the coast nearby. In *Op.* 643-44, he advised his brother that when it was necessary to trade his agricultural products, to load them into a large ship as the gain would be greater, but he cautioned (*Op.* 689-94) against shipping all his goods on a single ship for if the ship was lost, he would lose everything.[1157] In *Op.* 600, Hesiod advises his brother to "put away Demeter's holy corn in jars well and good and then dismiss his hired man" (paraphrased). In *Op*. 300, "work keeps the wolf of famine from the door; Well-crowned Demeter smiles and fills your store." (both passages trans. by A.E. Stallings).

Herodotus (4.152) remarked on Sostratus from Aegina when he told of a group of Samians who secured trade goods which they sold for a profit "greater than any

[1157] On Hesiod see Murray 2017, 57; Ready 2007; Tandy and Neale 1996; Lamberton 1988.

Greeks before their day, excepting Sostratus, son of Laodamas, an Aeginetan, with whom no one else can compare."[1158] The body of literary evidence from the 8th and 7th centuries, while small, suggests trade was the realm of individuals acting in self-interest.[1159] These were not state ventures but rather the work of individual actors.

Several terms developed that demonstrate the individual nature of Iron Age trade and exchange as products of individual enterprise: *ναύκληρος,* a ship owner trading for his own account, *ἔμπορος*, a merchant who travelled onboard but did not own the ship, both of whom travelled by sea on long distance trading ventures (such as Sostratus), a *κάπηλος* was a small trader in a local district.[1160]

Ancient and modern literature attributes innovative skills to political and military figures such as Themistocles, Cleisthenes, and Epaminondas. Plutarch's *Vitae Parallelae* was a parade of individual achievements.[1161] Van den Eijnde described the Philaidais' acquisition of northern Aegean territories a result of skilful entrepreneurship.[1162] Surely ancient merchants were entrepreneurial too, but their stories were not preserved in literature like political and military actions were.

## 5.7 Human Factors: What Drives the Decision to do more?

The archaeological findings provide compelling evidence on several islands that certain individuals or groups of individuals made the decision to pursue an additive

[1158] Athenian pottery produced for export is often found with written 'merchant marks' on them indicating their manufacture for a certain merchant. One common mark found is ΣΟ, Boardman suggested that perhaps this is the mark of Sostratus. See Boardman 2006a, 154-5 including photo of merchant marks.
[1159] See Manning 2018, 85 on individual merchants.
[1160] Reed 2003, 6-14; Rickman 1980, 141.
[1161] Jacobs 2017 argued that Plutarch's biographies focused on individuals assessing situations and solving problems; see Pelling 2002 and Mossman 1997 for more traditional view.
[1162] Van den Eijnde 2020, 74.

economic strategy. The analysis of the tribute lists helps to frame the material evidence on an island by island basis. However, the archaeology does not answer the question why. Humans take the actions they do for a variety of reasons. Morris has grouped these decisions into three categories: fear, greed, and sloth.[1163] These classifications seem compelling; fear leads to a group decision to invest labour and materials into building a fortification wall, greed is perhaps the driver behind making an investment in opening a quarry and pursuing distant markets, sloth cuts both ways in that it can explain staying at a subsistence level and doing nothing more but it may also mean investing in easier ways of doing things such as building multi-part block and tackle systems to make raising heavy objects less laborious.[1164]

Many factors coalesced in the early 8th century to set a wide range of processes in motion. Climate, technology, cross cultural exchange, an evolved political or social structure that devolved authority beyond family members, and the establishment of property rights, all seem to have played a role in making the decision to do more. The Cycladic islanders by virtue of their geographic position in the centre of Aegean trade routes and their entrepreneurial sense of adventure, demonstrated through the ceramics found in the earliest levels at Al Mina and at Naucratis, suggest that they were seeking, or at least were receptive to, new things. Euboeans had been similarly adventurous in the Early Iron Age with trade activities both in the Levant and in the west at Pithekoussai.[1165] The situation in Crete in the early Archaic period stands in stark contrast to the development seen on many of the Cycladic islands. Cycladic

[1163] Morris 2011, 89, 112.
[1164] 'Sloth' as used by Morris equates with Renfrew's Principle of Least Effort, see Renfrew 1982b, 265.
[1165] Euboean pottery is not found after about 700 at either Al Mina or Pithekoussai. See Vacek 2017, 50, Fig. 7.1 on Al Mina; Boardman 1999a, 165 on Pithekoussai.

ceramics were distributed over a wide area including Egypt, the Levant, and the northern Aegean suggesting an expansive trade network. Ten Cycladic *poleis* were minting coins as much as 70 years earlier than in Crete. Parians and Naxians were quarrying marble, the Siphnians mining gold and silver and the Melians kaolin and other minerals in the 7th century. In Crete, there is only minimal evidence of similar kinds of development. Cretan ceramics are not widely distributed. Marble resources in eastern Crete existed but were not exploited.[1166] One small quarry has been identified west of modern Siteia where marble was quarried sometime in the Classical and Hellenistic period. Platon identified 7th and 6th century pithoi fragments in the area but it is unclear if they were in association with the quarry.[1167] Durkin and Lister were unable to date the quarry beyond saying it was Greek, not Roman. They suggest the closest parallel is with tool marks and quarrying techniques seen in the area of the Pnyx in Athens dated to the 4th century.[1168] This creates the impression that the conservative Cretans were warry and reticent of change.[1169] The Cycladic evidence suggests a coming together of multiple developments; social, economic, and entrepreneurial in the Iron Age Cyclades that did not manifest themselves in Crete.

[1166] See Kneuker, Dörr, Petschick, and Zulauf 2015, 359-60, Figs 3-5, 10 on marble resources in the Mirabello Bay area near Olous, Vrokastro, and Azoria; Seidel 2003, 77 on marble near Lato; Barker 1976, 366, 371 on marble strata on the island of Mochlos near Azoria and on the southern shore of Mirabello Bay.
[1167] Platon 1954, 156.
[1168] Durkin and Lister 1983, 69-70, 83, n7.
[1169] Cycladic finds at Al Mina date to 10th c. while the earliest Cretan material at Tocra dates to 650-630. See section 3.3.9; Vacek 2017, 49; Boardman 1996, 157 on Al Mina date and Shaw 1982, 190-1 on Tocra. Knossos and Kommos have evidence of imports in the 10th c. contexts but there is no export evidence until much later when exports are found in the Cyclades at Thera in LG and not on Delos until after 700. See Coldstream 2003, 215, 228 on Cycladic finds; Antoniadis 2017 and Kourou 2008 on Knossos; Shaw and Shaw 2000 on Kommos; see Erickson 2010, 15-19 on Cretan conservatism generally.

Gladwell termed the coalescing of building blocks such as occurred in the Cyclades a tipping point.[1170] He postulated that ideas, products, messages, and behaviours spread like viruses do in an epidemic.[1171] He suggests the combination of contagiousness, the fact that little causes can have big effects, and that change happens, not gradually, but at one dramatic moment, indicates a tipping point had occurred. The evidence presented suggests a tipping point happened in the Aegean at the turn of the Late Geometric to the Archaic period.

[1170] Gladwell 2015, 7-9.
[1171] A prescient observation, sadly.

# 6 Conclusion

This thesis covers a long period of time from the Aegean Bronze Age through to the Persian Wars for the purpose of demonstrating that Aegean society went from a relative high point in the Late Bronze Age through a considerable retrenchment in the Early Iron Age to recovering and ascending to a an even greater period of prosperity in the Archaic period.[1172] The primary focus of the examination is the archaeology of the Cyclades during the 9th to 6th centuries when the evidence indicates a remarkable inflection point in the economic and social conditions occurred. The *longue durée* of the examination sets the Iron Age development of economic and social institutions into a comprehensive context.

The Late Bronze Age evidence provides compelling examples of additive economic strategies. Writing systems such as Linear A and B and annotated clay sealing protocols were developed.[1173] Common standards for weights and measures were utilized.[1174] In Crete, flocks of sheep as large as 100,000 animals were recorded in Linear B tablets.[1175] Isotope analysis of copper and tin finds in Minoan contexts indicate Cycladic, Cypriot, and Anatolian origin metal.[1176] The archaeological and written evidence suggests long-distance trade developed.[1177] Evidence from Cycladic Late Bronze Age settlements at Ayia Irini on Keos and at Phylakopi on Melos indicate that they were participants in a larger Aegean *koine* or trade network (see Section 3.3.3).

[1172] Ober 2015, Fig. 1.1.
[1173] Pope 1964, 1-8, p. 6 on pre-Linear A writing systems; Branigan 1987, 248; Macdonald 2010, 536; Shelmerdine 2008, 11. Cretan Hieroglyphic writing system dated from MM IA-II, Linear A from MM IB- LM IB, Linear B LM II-IIIB.
[1174] Doumas 2010b, 757.
[1175] Ventris and Chadwick 1956; Palmer 1958, 87.
[1176] Gale and Stos-Gale 2008, 387-90, Table 37.2.
[1177] Cline 2014, 18-19.

Following the collapse of Mycenaean palace centres, evidence of long-distance trade is no longer found. Imported items are restricted to a few copper bowls from Cyprus found in Crete and on Saronic Salamis.[1178] The Cycladic record for trade goods is blank. It is noteworthy that when evidence of trade becomes apparent again in the late 10th century, there is no evidence of the centralized Late Bronze Age economic system being recreated. Linear B, the sealing systems, and common weights and measures on the Minoan standard were not reinstituted. There was continuity of cult, however. Open air altars from Koukounaries on Paros and at Yria on Naxos suggest continuity as does sporadic cult evidence from Temple A at Ayia Irini on Keos.[1179] The Protogeometric and Early Geometric evidence is limited to a few small settlements such as Koukounaries on some but not all islands, with locally produced ceramic assemblages for the most part. Economic evidence of an additive economic practices or wider trade contacts is not found at any Cycladic site.[1180]

Beginning in the later 10th century, evidence of renewed habitation of older settlements and the establishment of new settlements becomes apparent. New settlements without Bronze Age antecedents were established on Andros at Zagora and Hypsili, on Kythnos at Vrykastro, and at Minoa on Amorgos.[1181] Settlements at Koukounaries on Paros, Grotta on Naxos, and Xobourgo on Tenos reorganized themselves in new areas adjacent to their Late Bronze Age predecessor locations.[1182] In the 9th century, more settlements were founded; On

[1178] Kourou 2008, 364.
[1179] On Koukounaries see Schilardi 2016, Fig. 115; Gounaris 2005, 21-2, 29-30, 41, Fig. 13; On Yria see Charalambidou 2017, 375.
[1180] Morris 2006, 72 suggests the Greek recovery from the LBA collapse "was on the whole, an endogenous regeneration."; Papadopoulos 2014, 182-86 argued perhaps the strongest for continuity with the LBA.
[1181] On Zagora see Cambitoglou 1981, 84, 99, 121; On Hypsili see Televantou 2012, 2008a, 62; On Vrykastro see Mazarakis Ainian 1998, 377; On Minoa see Marangou 2002b, 175-7.
[1182] In case of Grotta next to, at Xobourgo on top of, and at Koukounaries both.

Kythnos at Kastro, Kastellas, and Ayia Ioannis, at Mandra on Despotiko, on Delos, and at Thera. In the 8th and 7th century, many more follow (see Appendix B).[1183]

Evidence of renewed long-distance trade is datable possibly to the late 10th and with certainty to the 9th century, based on finds of first Cycladic and later Euboean material at Al Mina in Northern Syria.[1184] Euboean material was found in the Cyclades on Andros and Naxos dating to this same period. The nature of the contact is uncertain as the ceramics were almost all drinking shapes; evidence of contact but not evidence of what was being traded. Nonetheless, the ceramics do suggest the rediscovery of entrepreneurial behaviour in some adventuresome individuals.[1185] Of significance for the Cycladic islanders, the Iron Age east to west trade pattern was different from the north to south trade of the Late Bronze Age. By virtue of their location between the Near East and mainland Greece, the Cyclades became the first stop in the conduit for contact between east and west. This brought not only trade goods but also ideas and new technologies that made receptive Cycladic islanders leading innovators in the Late Geometric and Early Archaic periods.

Evidence of social development was preserved in Cycladic burial practices seen at Grotta on Naxos, Xobourgo on Tenos, Minoa on Amorgos, and in building architecture at Yria on Naxos and Koukounaries on Paros.[1186] Burial rites transitioned diachronically from family cist graves and pyre pits, to enclosures surrounding the graves suggesting a larger clan orientation, to platforms or

[1183] On Siphnos see Brock and Mackworth Young 1949, 31-3; On Melos see Catling 2005, 70; Cherry 1982b, 306; On Delos see Mazarakis Ainian 1997, 329, On Thera see Pavlou 2015, 125; Sperling 1974, 324; Zafeiropoulou 1971, 226-30.
[1184] Vacek 2017; Luke 2003.
[1185] Osborne 2007a on what pottery finds do and do not represent.
[1186] On Grotta see Lambrinoudakis 2004; 1988; On Xobourgo see Kourou 2015; 2011; On Minoa see Marangou 2002b; Mazarakis Ainian 1997, 195-6; On Yria see Charalambidou 2017; On Koukounaries see Schilardi 2016; Gounaris 2005.

eschara for communal celebratory rites including feasting. The building architecture similarly transitioned from open air altars to small single room cult structures that grew successively larger into multi-room buildings with benches around the perimeter for communal feasting. Eventually on all the islands (but not all at the same time), a *polis* system wherein authority was devolved to non-family members took place.[1187] One of the identifiers of a *polis* has been the communal decision to build fortification walls. Evidence of Archaic period or earlier fortification walls can be found on almost every island.[1188]

This societal transition appears to have been a largely peaceful process in the Cyclades. Cycladic Iron Age grave goods are remarkably uniform between graves, consisting of a few ceramic pieces for the most part, unlike the elaborate grave goods found at the Toumba cemetery in Lefkandi, in the Athenian Kerameikos, and at Teke in Crete.[1189] Other than literary evidence of conflict between Paros and Naxos and possibly the communal burials in the polyandria at the Vitzi cemetery in Paroikia, generally the island groups throughout the Iron Age appear to have had a peaceful co-existence.[1190] Siphnos was attacked by Samians *c.* 525 and both Paros and Naxos withstood sieges by non-Cycladic forces organized by Aristagoras *c.* 500 (Hdt. 3.57-8, 5.33-4), but groups within the Cyclades seem not to have had military confrontations for the most part. It is postulated that being islands with clearly demarcated borders created an environment different from mainland Greece and in Crete where martial conflict over *poleis* boundaries was the norm.

The benefits of the Cycladic geographic position and the islanders' receptiveness to new ideas can be clearly demonstrated in the 7th century. About 650, several

[1187] Documented through epigraphic evidence in many cases. See Reger 2004, 732-93.
[1188] Papadopoulos 2014, 186-7; Hall 2014, 90-4.
[1189] Bohen 2017; Kotsonas 2006, 159-61; Thomas and Conant 1999, 89-91, 94-6.
[1190] Schilardi 2002, 240.

innovations came together nearly simultaneously that were to have major impacts; hard rock mining technology, heavy lifting technology, and the alphabet.[1191] Cycladic craftspeople produced the first monumental marble statuary in Greece along with some of the first monumental architecture.[1192] Speculatively, the political developments of the *polis* system probably were a determining factor in establishing property rights that allowed large scale projects such as marble quarrying on Paros and Naxos, silver and gold mining on Siphnos, and the construction of harbour moles on Andros and possibly Melos. All are examples of an additive economic strategy being adopted by those groups of islanders. The ample evidence of the early adoption of the alphabet in the Cyclades is indicative of the Cycladic receptiveness to new ideas. Some of the earliest Archaic inscriptions were found on Thera.[1193] The alphabet had the effect of lowering transaction costs especially for long-distance larger scale transactions involving marble and artisanal expertise.[1194]

The data discussed in the last chapter clearly shows that not all islanders adopted an additive economic strategy. Islanders inhabiting islands lacking sufficient agricultural land are hypothesized not to have been able to produce enough food to support a population large enough to spare labour for non-agricultural activities. Islands that did have ample farmland but where evidence of additive economic behaviour is lacking such as Tenos and Syros, are more difficult to explain. The hypothesis put forth in this thesis is that it was the actions of certain individuals focused on doing more, that provided the spark that turned into

[1191] On hard rock mining see Fullerton 2016; Boardman 2006b, 18-19; 1978, 18, 22-3; Palagia 2006, 244; On heavy lifting see Pierattini 2019; On alphabet see Lemaire 2008; Boardman 1999a; Jeffrey 1990; Carpenter 1933.
[1192] Kokkorou-Alevras 2017, 26-9.
[1193] Mazarakis Ainian 1997, 331, n597 dated some to late 8th c. early 7th c.; Jeffery 1990, 318f; Carpenter 1933, 20, 26, Fig. 7.
[1194] Morris 2004, 731.

additive economic practices. For indeterminate reasons, this spark either did not occur or did not catch everywhere.

How to concisely differentiate a simple society from a complex society has been an elusive exercise for scholars. Morris suggested a ten-step trait list to measure progress in regeneration of complex societies following a collapse, when evidence of enough traits are seen, the society is deemed to have transitioned from simple to complex. Morris's traits are: Urban centres, Payment of taxes and rent by peasants, Monuments, Ruling Classes, Information recording systems, Long-distance trade, Craft specialization and advanced art, Military power, Scale, and Standards of living.[1195] The archaeological evidence from the Cyclades indicates that the Cycladic islanders, at least in the 'high *phoros*' group, manifested all these traits by the Early Archaic period except for evidence of payment of taxes and Ruling classes. Morris had difficulty applying all his trait list categories to Iron Age Greece. He redefined the payment of taxes to the collection of harbour dues.[1196] We do not have archaeological evidence of tax collection from this period, but the construction of harbour facilities as seen at Palaeopolis on Andros, suggests this might have occurred. Morris also had difficulties defining a ruling class in Iron Age society. In the Late Bronze Age palace structure, there were clearly rulers (*wanakes*) but this terminology did not carry through to the Iron Age. He recognized the homogeneity of burial goods as noted above but suggested that restricted access to cult activities may have been a distinguishing societal separation.[1197] This seems difficult to demonstrate. Looking for an example of Cycladic practices, there is no evidence suggesting if access to the Gathering House at Koukounaries was restricted or not.

[1195] Morris 2006, 73-81.
[1196] Morris 2006, 75.
[1197] Morris 2006, 76-7.

The archaeological data presented here suggests that a more expeditious evaluative technique than a trait list is to look for development of an additive economic strategy that takes a society beyond a subsistence level to producing an economic surplus.[1198] If an individual or a group makes the very simple but profound decision to do more than pursue a base subsistence existence, and then successfully executes that strategy, all the rest of the traits will follow from the creation of an economic surplus. This approach also has the advantage of being multi-scalar; you can look for evidence from a single farmer to grow more olive trees than needed, or for an island community to develop a quarry or build a harbour mole.

The archaeological evidence from sites and trade goods on both a macro and micro scale seen in the Cyclades between 1000 – 480 has provided compelling evidence of the steps islanders took in regenerating complex society in these islands. The next logical step is to test the applicability and veracity of this model through another case study.[1199] The first thought is to examine the European dark age that occurred after the fall of the Roman Empire in the west. Studying the western Mediterranean islands such as Sardinia, Corsica, or the Balearics seems attractive, but, after a brief examination, the successive disruptions caused by invading Vandals, Ostrogoths, Byzantines, and Saracens seems to have resulted in continuous retrenchment.[1200] A more settled situation than ensued in the west between 500 – 1000 CE seems a better prospect for examination. Geographical diversity is a possibility. Studies of social regeneration by Inca peoples in the Peruvian Andes and the classical to postclassical Mayan transition have been

[1198] Renfrew 1982b, 264-90 corroborated his PBS model with evidence of economic activity and state formation rather than a trait list. He specifically excluded references to either 'economic man' or a monetary economy.
[1199] Tainter 1988, 5-21, 45-76 on collapse in a myriad of periods and locations.
[1200] Brigaglia, Mastino, and Ortu 2006 on history of Sardinia.

undertaken.[1201] The forced reopening of Tokugawa Japan in the 1860s is a unique possibility in a modern, industrial context. Looking towards an earlier period, the Aegean presents another compelling case for examination. As discussed in Chapter 3, Early Bronze Age trade in metals and technology moved from the Cyclades to Crete. In the Middle Cycladic period, there seems to have been a significant dislocation throughout the Aegean.[1202] The recovery in Crete beginning *c.* 2000 BCE when the steps towards the palace system can first be seen and culminating in the wide area trading networks of the Late Bronze Age would make a useful bookend to this study of recovery following the collapse of the palace system.

As the present study has shown, a broad sweep of data must be considered in completing an analysis of the myriad and interrelated steps involved in redevelopment of a complex society. To focus on a chosen subset of the available material could miss important aspects of how development occurred. This thesis has reduced the key steps to several broad observations; technical innovation, a social system in which property rights are clearly delineated, additive economic practices, and an entrepreneurial spirit, but each one of these is comprised of many parts that played out differently island by island. This could only be seen after considering all the material available.

[1201] On Inca see McEwan 2006; On Mayan see Chase and Chase 2006.
[1202] Renfrew 2011, 47-53, Tables 14.7, 14.8.

# 7 Appendix A: Pottery Sequences

***Table 4 Pottery Chronologies***

| Chronology | | Crete | Cyclades | Greece |
|---|---|---|---|---|
| High | Low | | | |
| | 3100 | | | |
| | 3000 | EM I | EC I | EH I |
| | 2900 | | | |
| | 2800 | | | |
| | 2700 | | | |
| | 2600 | | | |
| | 2500 | EM IIA | | EH IIA |
| | 2400 | | EC II | |
| | 2300 | EM IIB | | EH IIB |
| | 2200 | | | |
| | 2100 | EM III | EC III | EM III |
| | 2000 | | | |
| | 1900 | MM IA | MC I | MH I |
| | 1800 | MM IB | MC II | MH II |
| | 1700 | MM II | | |
| 1700 | 1600 | MM III | MC III | MH III |
| 1600 | 1500 | LM IA | LC I | LH I |
| 1500 | 1400 | LM IB | LC II | LH IIA |
| 1400 | 1300 | LM II; IIIA1, A2 | | LH IIB, IIIA1, IIIA2 |
| | 1200 | LM IIIB | LC III | LH IIIB |
| | 1100 | LM IIIC | | LH IIIC |
| | 1000 | Subminoan | Submycenaean | Submycenaean |
| Note Scale Change | 950 | | Protogeometric | Early, Middle Protogeometric |
| | 900 | Early, Middle Protogeometric | | Late Protogeometric |
| | 850 | Late Protogeometric | EG | EG |
| | 800 | EG | MG | MG |
| | 750 | MG | | LG |
| | 700 | LG | LG | |
| | 650 | Early Orientalizing | Orientalizing | EarlyArchaic |
| | 600 | Late Orientalizing | | Archaic |
| | 550 | Archaic | Archaic | |
| | 500 | | | Black Figure |

The Pottery Chronology is a compilation of several works: Murray 2017, 4, n3; Gagarin and Perlman 2016, xxxiii; Shelmerdine 2008, Fig 1.1; Momigliano 2007, Tables 0.1, 0.2; Dickinson 2006, Fig 1.1; Coldstream 2003, 22, 385; Boardman 2001, 12; Morris 2000, Table 1.1; and Cambitoglou 1981, 16-17. These sources are in broad agreement, but there are differences which have been reconciled by rounding in the creation of this table. The Cretan sequences are largely based on stratigraphy from Knossos and the Helladic on that of Athens. The Cyclades are more challenging as there is no one site that had continuous stratigraphy from Early Bronze Age through to the end of the Archaic period. Moreover, variations between islands are evident; Coldstream 2003, 385 gave five sequences: Paros, Naxos, Thera, Melos, and Euboea, demonstrating slight differences in the adaptation of certain phases.[1203] Morris suggested that dating pottery chronologies is not an exact science; a plus/minus factor of 25 years, one generation, was in practical terms the degree of precision archaeologists were likely to achieve.[1204] The purpose of this table is to give readers a reference for pottery sequences given in site reports, which are almost always given in terms of their pottery sequence rather than absolute terms, as absolute terms are largely indeterminate unless there are cross-referenced datable finds within the same context.[1205]

To bring harmony to the terminology used with the body of the text, the following titles for pottery sequences were applied.[1206]

[1203] See Pappa 2012 on reconciling differences.
[1204] Morris 2000, 6.
[1205] Morris 1987, 10-14 gave a good discussion of the challenges of cross-referencing to get absolute dates for various pottery phases.
[1206] Hallager 2010 suggested dropping the category Sub-Mycenaean. Orientalizing was also considered a more appropriate term for art history though it is discussed in Chapter 3.

| **Term Used in Text** | **Period Described** |
|---|---|
| Late Bronze Age | LHIIIB and earlier |
| LHIIIC | Post-destruction, end of Bronze Age |
| Protogeometric | Includes Sub Mycenaean, EPG, MPG, LPG |
| Early, Middle, Late Geometric | same |
| Early Archaic, Archaic | Early = 7$^{th}$ c., Archaic = 6$^{th}$ c. and later |

# 8 Appendix B:

## 8.1 Table of Settlement Sites by Period of Occupation

N.B. Organized by order presented in Chapter 4, Site Reports

***Table 5 B1 Table of Settlement Sites by Period of Occupation***

| **Table B-1** | | **CYCLADIC SETTLEMENT SITES BY CENTURY** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| | | | | | | | | | | |
| **Island** | **13 c.** | **12 c.** | **11 c.** | **10 c.** | **9 c.** | **8 c.** | **7 c.** | **6 c.** | **5 c.** | **Comments** |
| **Site** | | | | | | | | | | |
| Keos | | | | | | | | | | |
| Ayia Irini Site | x | x | x | | | | | | | |
| Ayia Irini Temple A | x | x | x | x | x | x | x | x | x | |
| Koressos | | | | | | | x | x | x | |
| Ioulis | | | | | | | x | x | x | |
| Poieessa | | | | | | | x | x | x | |
| Karthaia | | | | | | | x | x | x | |
| | | | | | | | | | | |
| Kythnos | | | | | | | | | | |
| Vrykastro | | | | x | x | x | x | x | x | |
| Kastro | | | | | x | x | | | | |
| Kastellas | | | | | x | x | | | | |
| Ayia Ioannis | | | | | x | x | | | | |
| | | | | | | | | | | |
| Seriphos | | | | | | | | | | |
| Chora | | | | | | | x | x | x | Unexcavated |
| | | | | | | | | | | |
| Siphnos | | | | | | | | | | |
| Aghios Andreas | x | x | | | | x | x | x | x | Minoa |
| Kastro | | | | | | x | x | x | x | |
| Apollonia | | | | | | | | | | Unlocated |
| Aghios Nikitas | | | | | | | | x | x | some LBA pottery in the area |
| Pf. Elias Troulakiou | | | | | | | | x | x | |

| Island | 13 c. | 12 c. | 11 c. | 10 c. | 9 c. | 8 c. | 7 c. | 6 c. | 5 c. | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| **Site** | | | | | | | | | | |
| Siphnos cont. | | | | | | | | | | |
| tis Baronas to Froudi | | x | x | | | | | | | inhabited after abandonment of Aghios Andreas, pottery all LHIIIC |
| | | | | | | | | | | |
| Melos | | | | | | | | | | |
| Phylakopi | x | x | | | | | | | | |
| Ancient Melos | | | | | | x | x | x | x | |
| Emborio | | | | | | | x | x | | |
| Kambos | | | | | | | x | x | | |
| Zephira | | | | | | x | | | | |
| Aghios Spyridon | | | | | x | x | | | | |
| 1976 Survey | | | | | | | x | x | x | 39 Archaic sites identified, consolidated to 28 in Classical and 15 in Hellenistic. |
| | | | | | | | | | | |
| Kimolos | | | | | | | | | | |
| Ellenika | x | | | | | x | x | x | x | |
| Kastro | | | | | | | x | x | | |
| | | | | | | | | | | |
| Paros | | | | | | | | | | |
| Koukounaries | x | x | | x | x | x | x | x | | |
| Paroikia | x | | | | | x | x | x | x | |
| Kargadoura | | | | | | x | x | | | |
| Filizi | | | | | | x | x | | | |
| Sarakinika | | | | | | x | x | | | |
| Livadera | | | | | | x | x | | | |
| Chalasmata | | | | | | x | x | | | |
| Ag. Ioannis Detis | | | | | | x | x | | | |
| Oikonomos | | | | | | x | x | | | |
| Marathi | | | | | | | x | x | x | Mines |

| **Island** | **13 c.** | **12 c.** | **11 c.** | **10 c.** | **9 c.** | **8 c.** | **7 c.** | **6 c.** | **5 c.** | **Comments** |
|---|---|---|---|---|---|---|---|---|---|---|
| **Site** | | | | | | | | | | |
| Despotiko | | | | | | | | | | |
| Mandra | | | | | x | x | x | x | x | |
| Antiparos | | | | | | x | x | x | x | |
| | | | | | | | | | | |
| Naxos | | | | | | | | | | |
| Grotta | x | x | x | x | x | x | x | x | x | |
| Yria Sanctuary | x | x | x | x | x | x | x | x | x | |
| Tsikalario Cemetery | | | | | | x | x | x | x | |
| Sangri Sanctuary | | | | | | | x | x | x | |
| Melanes Sanctuary | | | | | | x | x | x | x | |
| Delos | x | | | | x | x | x | x | x | LBA settlement abandoned in LHIIIB, not LHIIIC. |
| | | | | | | | | | | |
| Donousa | | | | | x | x | | | | |
| | | | | | | | | | | |
| Andros | | | | | | | | | | |
| Zagora | | | | x | x | x | x | x | x | site abandoned c. 700, temple continued in use. |
| Hypsili | | | | x | x | x | x | x | x | founded end of 10th or early 9th c. |
| Palaeopolis | | | | | | | | x | x | |
| | | | | | | | | | | |
| Tenos | | | | | | | | | | |
| Vrykastro | x | x | | | | | | | | |
| Xobourgo | | x | x | x | x | x | x | x | x | |
| Kardiani cemetery | | | | x | x | | | | | Sub-PG and EG amphoriskoi. |
| Mycenaean Chamber Tomb | x | | | | | | | | | |

| Island | 13 c. | 12 c. | 11 c. | 10 c. | 9 c. | 8 c. | 7 c. | 6 c. | 5 c. | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| **Site** | | | | | | | | | | |
| Mykonos | | | | | | | x | | | Relief amphora |
| | | | | | | | | | | |
| Thera | | | | | | | | | | |
| Thera Town | | | | | x | x | x | x | x | |
| Therasia | | | | | | x | | | | No Archaic settlement found; just Geometric surface pottery |
| Oia | | | | | | | | | | Unexcavated |
| Skaros | | | | | | | | | | Unexcavated |
| Oea (port) | | | | | | x | | | | |
| | | | | | | | | | | |
| Anaphe | | | | | | | | x | x | Unexcavated, earliest find is kouros dated late 6th c. |
| | | | | | | | | | | |
| Amorgos | | | | | | | | | | |
| Mycenaean cemetery | x | | | | | | | | | |
| Arkesini | | | | | | | | | | Unexcavated |
| Minoa | | | | x | x | x | x | x | x | |
| Aegiale | | | | | | | | | | Unexcavated |
| | | | | | | | | | | |
| Ios | | | | | | | x | x | x | |
| Sikinos | | | | | | | x | x | x | |
| Folegandros | | | | | | | x | x | x | |
| Rhenia | | | | | | x | x | x | x | |
| Syros | | | | | | x | x | x | x | |
| Ano Koufonisi | | | | | | x | | | x | |
| Keros | | | | | | | | | x | |

## 8.2 Table of Protogeometric Pottery

***Table 6 B2 Table of Protogeometric Pottery***

| **Table B2** | | **Protogeometric Pottery** | |
|---|---|---|---|
| | **Location** | **Context** | **References** |
| Keos | | | |
| | Ayia Irini | Room 6 of Temple A on floor of Shrine BB | Caskey, M. 1998, 127, Figs. 11, 23, n16. |
| | North Survey | One sherd identified as PG or EG (cup base with pink fabric, thin black gloss) | Sutton 1991, Fig. 5, item 29.6 in gazetteer, p. 95. |
| | | Possible: banded Corinthian cup rim and spout of a basin, coarseware pithos rim and Corinthian handle. | Sutton 1991, gazetteer items 7.6, 59.8, 20.2, 26.14. |
| | Southern Survey | one sherd from near Tourkos and one near Karthaia. | Mendoni 1994, 150, 152. |
| | | | |
| Kythnos | | | |
| | Vrykastro | One PG skyphos sherd on middle terrace. | Mazarakis Ainian 2005, 87; 1998, 372. |
| | | Adyton PG jewellry and heirloom items | Koutsoumpou 2017, Mazarakis Ainian 2005, 99. |
| | | | |
| Melos | | | |
| | Survey | One PG sherd from Agios Constantinos. | Cherry 1982b, Appendix A. |
| | | | |
| Paros | | | |
| | Koukounaries | One Athenian krateriskoi | Schilardi 2016, Fig. 80; 1984, 206; Gounaris 2005, n118. |
| | Delian | Protocorinthian aryballoi may be PG but excavator did not comment | Rubensohn 1962, 117-8. |

| **Table B2** | **Protogeometric Pottery** | |
|---|---|---|
| **Location** | **Context** | **References** |
| Naxos | | |
| Grotta | 7 PG graves and pottery, found in disturbed condition | Sfyroera 2018, 328-30; Charalambidou 2017, 375-6; Thomatos 2006, 255; Mazarakis Ainian 1997, 188-9; Lambrinoudakis 1988, 235. |
| Aplomata cemetery | Grave 12, one-handed cup with three concentric compass drawn circles | Kourou 2015, 85, Figs 2, 3a-b. |
| Plithos cemetery | Euboean LPG pottery | Charalambidou, Kiriatzi, and Müller 2017, 113, 116; Kourou 2015, 89, 91-2. |
| Yria | possible sub-Mycenaean and PG pottery excavated near open-air altar | Lambrinoudakis 2004, 63. |
| | | |
| Donousa | | |
| Vathy Limenari | Late PG ceramics from East Greece | Coldstream 2003, 91-2. |
| | | |
| Andros | | |
| Zagora | Earliest pottery is Late PG amphorae and krateroid skyphoi c. 925. | Cambitoglou 1981. |
| Hypsili | Late PG habitation by pottery evidence end 10th or early 9th c. | Televantou 2008, 62. |
| | | |
| Tenos | | |
| Xobourgo | Unstratified LBA and PG pottery behind wall A on upper terrace | Kourou 2002, 258. |
| Kardiani | Sub-PG and EG amphoriskoi with vertical handles, skyphoi and cups | Kourou 2004, 429-30. |
| | | |
| Amorgos | | |
| Minoa | Late 10th c. PG from tombs in lower town is earliest evidence. | Gounaris 2005, 46; Marangou 2002b, 118, n339. |

# 9 Appendix C: Azoria, Crete and Environs

Crete has been more thoroughly archaeologically explored than the Cyclades have been, particularly regarding surveys. Many sites have been excavated and published to a high standard. The Iron Age settlements in the area surrounding Mirabello Bay east of central Crete provide interesting comparanda to Cycladic developments. This is especially true for Azoria. In Crete we see ample evidence of post-collapse LMIIIC refuge settlements. Nowicki compiled a gazetteer of 119 defensive sites in Crete *c.* 1200-800.[1207] The area around Azoria is presented here to demonstrate both refuge sites and the nucleation of sites into a single, larger settlement over the course of the Protogeometric and Geometric periods. The developmental pattern and many of the social constructs that we have seen in the Cyclades are represented at Azoria. What is missing though is evidence of much long-distance trade/contact or of an additive economic strategy. Azoria is not unique among Cretan sites in this regard and is presented here as representative of a larger pattern.[1208]

## 9.1 General Topography and Climate

Crete is the largest island in Greece with an area of 8,312 sq. km, 240 km in length, 48 km at its greatest width and just 12 km wide at its narrowest. The island is divided by significant mountain groups into zones (see Fig. 9.1).[1209] The White Mountains comprise the bulk of western Crete with several peaks near 2,400 m extending shear from the south coast, to Kydonia in the north, and almost to Eleutherna in the east. These rugged mountains seem to have limited habitation to the northern coastal plain.[1210] The central section is dominated by Mt. Ida, 2,456

[1207] Nowicki 2000; also, Kanta 1980.
[1208] See Erickson 2010 for an island wide analysis of evidence of contact both intra-island and from outside Crete.
[1209] Sweetman 2013, 10; Whitley 2013, 275-6; Wilson 2008, 77-9.
[1210] Nixon, Moody, and Rackham 1988.

m, the highest point on the island. The central massif divides north from south as well as east from west; the area around Knossos to the north and the fertile Mesara to the south are connected by multiple overland routes running either side of Mt. Ida. The eastern end of the island is split by two mountain groups: the area around Mt. Dikte (2,148 m) and the Thrypti (or Siteia) range (1,476 m) east of the Ierapetra isthmus, the narrowest part of the island. The Dikte massif can be transited overland on either the north or south sides. Within this mountain group is the high fertile plain of Lasithi, *c.* 900 m. The Thrypti range, while the lowest in height of the mountain ranges, rises as a sheer cliff from the valley floor and is steep-to the sea at the north-end making this range one of the more difficult areas of the island to transverse overland. The high mountains are covered with snow in the winter. In the spring, the run-off of snow-melt waters the high mountain plains such as Lasithi and Nidha as well as littoral plains via seasonal rivers and streams.[1211] Springs were an important source of water for settlements and may have influenced site location.[1212]


***Figure 9.1 Geological Features of Crete. From Google Earth.***

[1211] Pendlebury 1965, 5-6.
[1212] Nowicki 2000, 25-6.

The mountainous topography likely created multiple impacts on the settlement patterns observable on the island.[1213] A communicative logic dictated by the overland routes around and through the mountains may also have been a factor in the choice of settlement sites.[1214]

Crete forms the southern boundary of the Aegean Sea. Due south is North Africa, at the same latitude to the east is Cyprus and to the west Tunisia.[1215] The nearest Cycladic island to the north is Thera, 120 km distant. Melos is 140 km from Kydonia. There are not as many good natural harbours on Crete as the island's size would suggest.[1216] On the north coast (from east to west) Siteia, the area around Mirabello Bay, Poros-Katsambas (Knossos), Souda Bay and Kydonia are the best harbours. In the summer period the north coast receives the full brunt of the northerly *meltemi* which can create a dangerous lee shore for mariners. The south coast has fewer harbours; Matala and Kommos (where the coast turns north – south) provide shipment points for the Mesara area. The high mountains do create good navigational beacons for approach.[1217] Particularly the distinctive Siteia mountains and Mt. Juktas near Knossos.

Geologically, Crete sits where the north-moving African plate meets the European plate. Waters off the south coast are very deep right up to the coast (see Fig. 9.2). The meeting of the two plates creates active seismology resulting in many strong earthquakes.

[1213] Sweetman 2013, 11; Nowicki 2000, 22-4.
[1214] Pendlebury 1965, 1-23 produced a description of walking routes, distances and times of travel that could only have been developed in the period before road networks and automobiles became common in Crete.
[1215] Barrington Atlas 2000, Map 1.
[1216] Nowicki 2000, 20-2.
[1217] Pendlebury 1965, 1-3.

Crete is nearly twenty times larger than Naxos, the largest Cycladic island, 428 sq. km.[1218] Crete is larger, more mountainous, better watered, and more climatically diverse than any of the Cycladic islands.

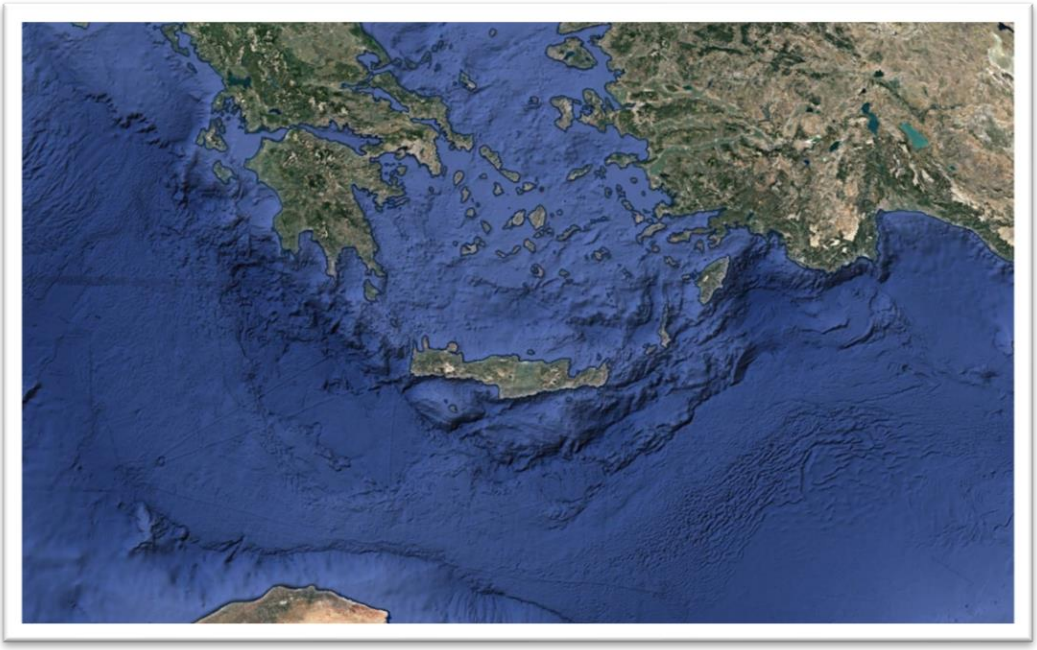

***Figure 9.2 Map of Ocean Floor. From Google Earth.***

## 9.2 Mirabello Region

The area of Central-East Crete between Mt. Dikte (Lasithi Plain) on the west and the Siteia Mountains on the east, along the north coast, and incorporating substantial hinterlands to the south, was populated with a significant number of Early Iron Age settlements. Twenty sites, all without Late Bronze Age antecedents, have been found as well as coterminous cemeteries and tombs.[1219] The foundation date for these communities is Late Minoan IIIC, post Late Bronze Age destruction,

[1218] Area references from McGilchrist 2010(17) *Naxos* and Pugsley 2010 *Blue Guide Crete.*
[1219] Haggis 2014, 121.

*c.* 1200-1100. These settlements existed independently from their foundation until *c.* 900 when they consolidated into seven regional clusters. Gaignerot-Driessen described these clusters as acropolis sites centred in extended catchment areas.[1220] These clusters are comprised of three coastal sites; Milatos, Olous, Istron, and four inland sites; Dreros, Lato, Oleros, and Azoria. These nucleated centres appear to have formed in areas that were corridors of interregional communication.

## 9.3 Azoria Cluster

The five sites of Vronda, Kastro, Azoria, Khalasmeno, and Katalimata proximate to modern Kavousi at the north end of the isthmus of Ierapetra form the Azoria cluster (see Fig. 9.3).[1221] The area at the north end of the Ierapetra isthmus is at the intersection of four major routes: west to Knossos (central Crete), south to Ierapetra and the Libyan Sea, east to Siteia via a rough pass through the Siteia Mountains, and east to Siteia along the northern foot of the Siteia Mountains (the route of the modern roadway).[1222] Several of these sites only have Late Minoan IIIC occupation levels and will be mentioned briefly. The bulk of the comments will focus on Vronda, Kastro, and Azoria where the process of consolidation is observable. Azoria is the only site in this cluster that was occupied in the Archaic period. Azoria is particularly well excavated and documented and can support a more thorough analysis than the other sites within the Mirabello region. Understanding of the area is enhanced from data collected during several regional surveys.[1223]

[1220] Haggis 2014, 121, Fig. 6.4.
[1221] Coulson 1998, 40; Kephala at Vasiliki is on the west side of the valley leading to Ierapetra and did not definitively feed into the consolidation at Azoria, consequently, is not discussed.
[1222] Boyd 1901, 130.
[1223] Haggis, Mook, Scarry, Snyder, and West III 2004, 340-1; Haggis 1996.


***Figure 9.3 Map of Sites near modern Kavousi. From Google Earth.***

## 9.4 Khalasmeno and Katalimata

These two sites are within 300 m of one another at the foot of the Kha gorge, a 700-meter-deep, V-shaped cleft in the western face of the Siteia Mountains, about five km south of modern Kavousi.[1224] Khalasmeno sits on a nearly flat rounded hill 230 m to the south of the Kha gorge entrance. Katalimata is perched on a series of eight terraces in the north cliff face of the gorge about 350 m (the site has a vertical range of 65 m). Access to Katalimata is restricted to a single, very perilous track arriving at the middle terrace (see Figs 9.5, 9.6).[1225]

Excavations at Khalasmeno have identified 27 units of architecture in an overall area of 0.65 ha (see Fig. 9.4). Construction technique was the same as Vronda, Kastro, and Vrokastro. Walls were built of local stone, either dry construction or at times with wet clay as a mortar, contiguous walls, and frequently utilizing

[1224] Tsipopoulou 2011, 333; Haggis and Nowicki 1993, 303-337.
[1225] Haggis and Nowicki 1993, 318-20, Figs 8, 9.

bedrock outcroppings in wall construction.[1226] Houses were of two or three rooms on an axial arrangement (doors on the short walls), even though the site topography did not restrict building to such an arrangement as it did on mountain-top settlements, indicating this was the preferred settlement design in the region.[1227] Room sizes ranged from 16-50 m². Pottery was concentrated within the site's footprint. Fineware consisted of certain Late Minoan IIIC types such as a cylindrical pyxis base, deep bowls, deep bowl bases and fragmentary surface finds.[1228] Coarseware fabrics at Khalasmeno and Katalimata were identical to Late Minoan IIIC finds from Vronda and Kastro.[1229] These Late Minoan IIIC fabrics were distinctly different from Early Minoan to Late Minoan IIIB coarseware fabrics found at other sites in the region such as Gournia, Mochlos, and Pseira.

[1226] Tsipopoulou 2011, 336, 345; Haggis and Nowicki 1993, 308-11, Fig. 4.
[1227] The spatial arrangement at Vronda is essentially like Khalasmeno with neither site restricted in plan by topographical features. See Haggis and Nowicki 1993, 310.
[1228] Tsipopoulou 2011, 337-44; Haggis and Nowicki 1993, 312 -313 fine wares, 314-318 catalog of coarseware with fabric notes. Pyxis base Fig. 5, item 26, Deep bowl Fig. 5, items 21-24, black sherd n17.
[1229] Haggis and Nowicki 1993, 314.

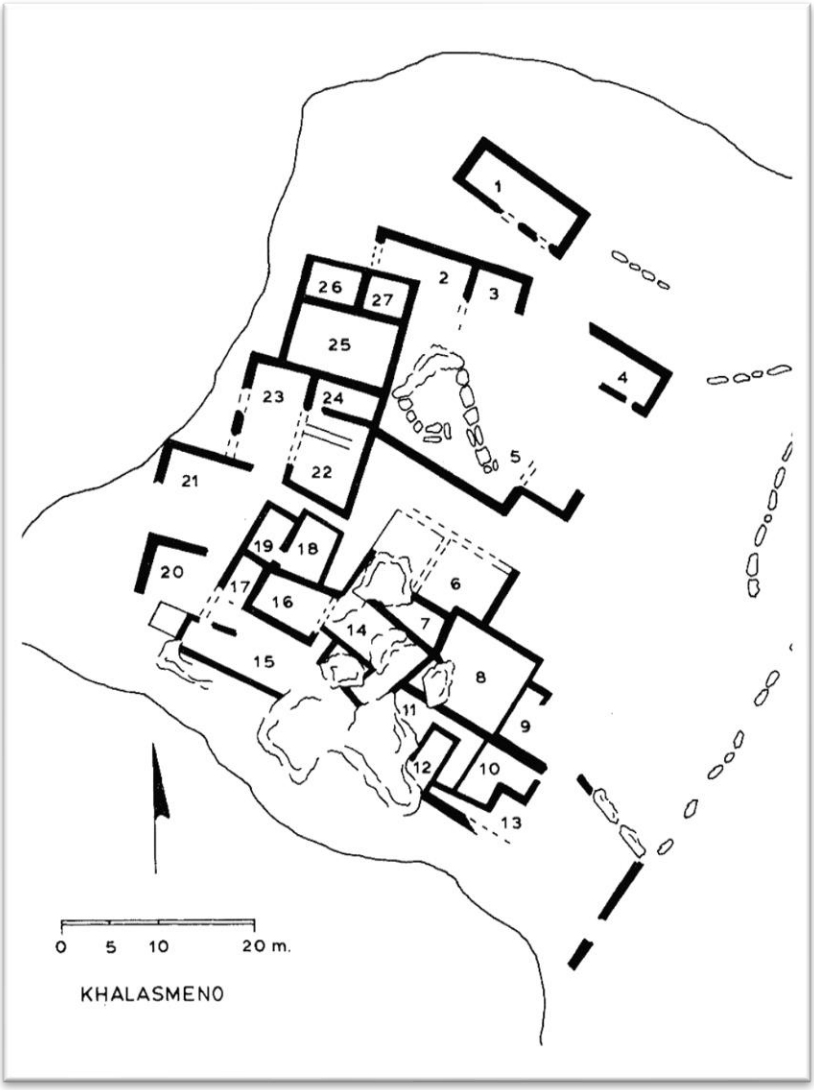


***Figure 9.4 Site Plan of Khalasmeno. From Haggis and Nowicki 1993, Fig. 4.***

The refuge at Katalimata consisted of three primary building areas 0.35 ha in total area. Building was of limestone rock pulled from the cliff face. Ten structures in total contain 10-15 house units ranging from 20-80 m² with an axial plan as at Khalasmeno. The site layout was by necessity restricted to the terrace outlines (see Figs 9.5, 9.6).[1230]

[1230] Haggis and Nowicki 1993, 318-28.

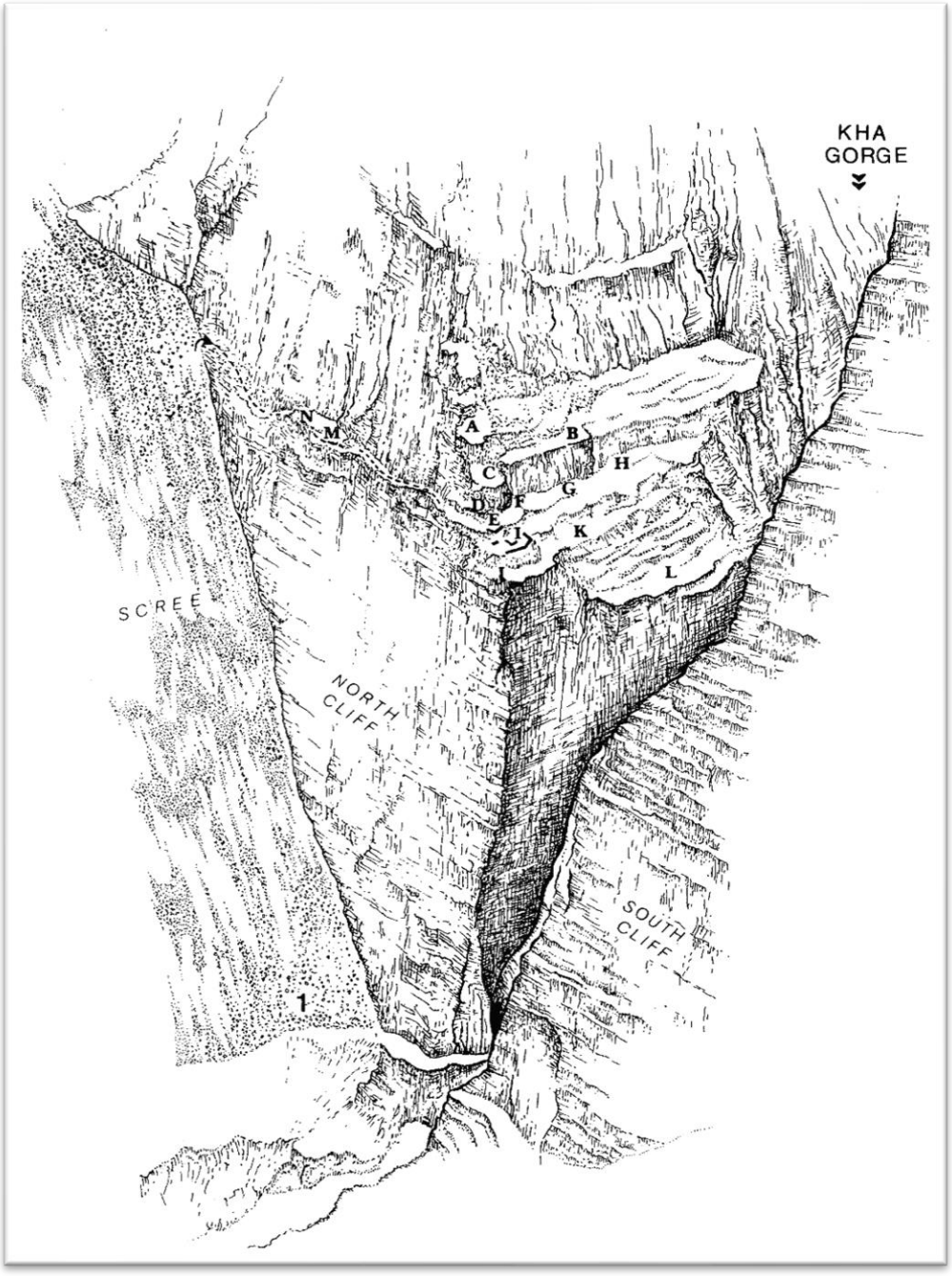


***Figure 9.5 Sketch of Katalimata. From Haggis and Nowicki 1993, Fig. 10.***

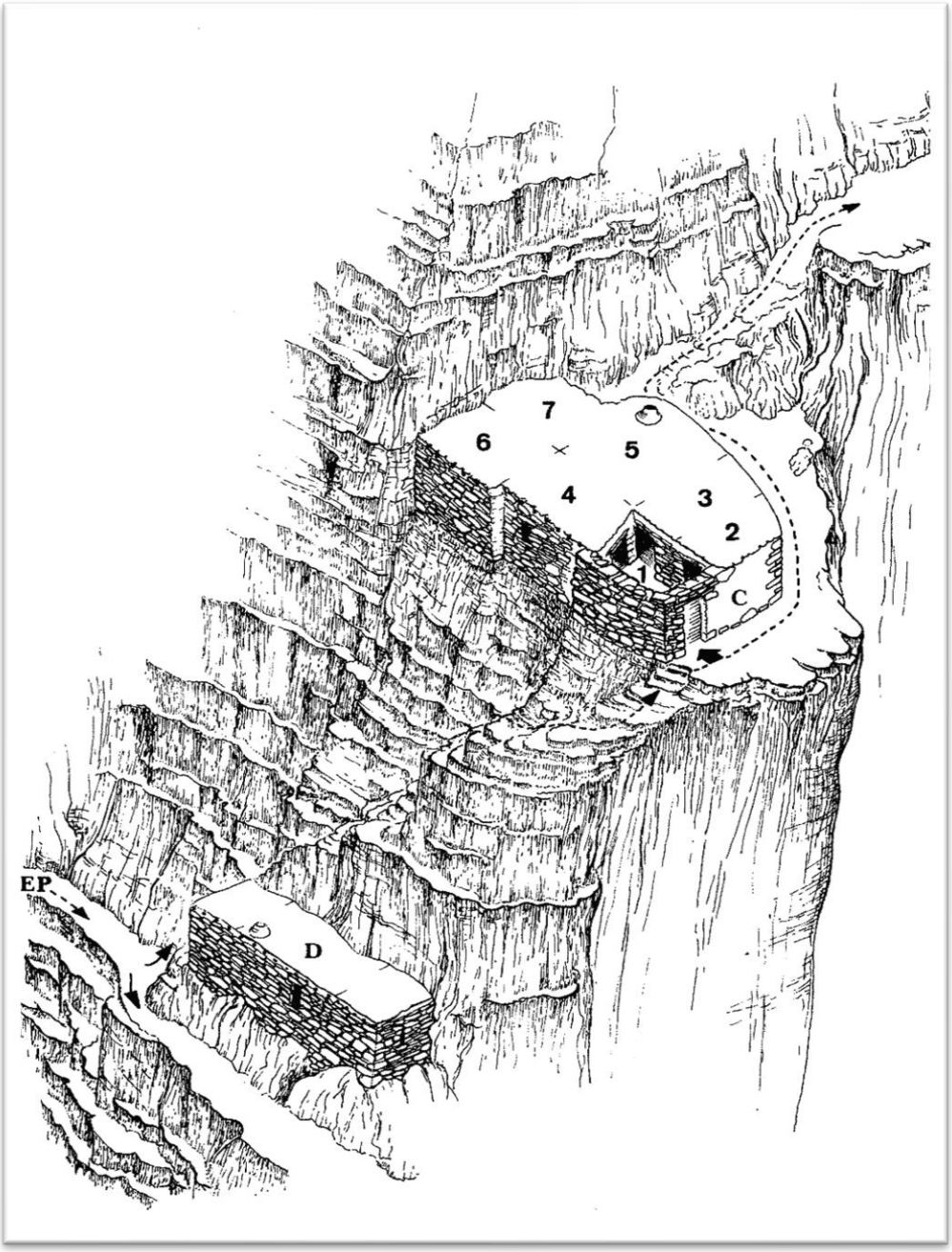


***Figure 9.6 Artists Reconstruction of Katalimata, entrance to site at lower left. From Haggis and Nowicki 1993, Fig. 13.***

Haggis and Nowicki suggest that the two settlements formed a dual settlement system.[1231] They suggested that Khalasmeno was a well-watered agricultural area paired with the defensible and hidden Katalimata.[1232] Both settlements had the same Late Minoan IIIC foundation dates and similar population capacities. They shared the same environment as they were proximate but were in topographically diverse areas which suggest functional differences between the two. No pottery dated post Late Minoan IIIC were noted by Haggis and Nowicki, suggesting that occupation at these sites did not continue into the Geometric period.[1233]

## 9.5 Vronda and Kastro

Vronda, Kastro, and Azoria are linked communities both diachronically and by proximity; all three are within one km one another (see Fig. 9.3).[1234] The evidence discussed below suggests that the population migrated between sites during the Early Iron Age, eventually concentrating at Azoria *c.* 600. Nowicki suggested that Kastro was the refuge site for the inhabitants of Vronda and Azoria in the Subminoan (Protogeometric) and Geometric phases.[1235] (See Appendix A, Cretan pottery sequences can vary from Cycladic.) Azoria's habitation extended to the first part of the 5th century.[1236]

Vronda and Kastro were first excavated by Boyd in 1900 and later, more systematically in the 1980s. The importance of Azoria was only fully understood when a series of excavations commencing in the 2000s were undertaken.

[1231] Haggis and Nowicki 1993, 334-5.
[1232] Nowicki 2011, 363-5.
[1233] Tsipopoulou 2011, 333 concurred with LMIIIC terminal date; Haggis and Nowicki 1993.
[1234] Nowicki 2000, Fig. 43; Haggis 1993, 144-53 referred to the three settlements as "Kavousi cluster" named after the nearby modern village.
[1235] Nowicki 2000, 99-100.
[1236] Haggis, Mook, Coulson, and Tobin 1997, 317.

Vronda is on a low ridge 425 m southwest of modern Kavousi.[1237] 1983-1984 excavations uncovered a settlement area 61 m by 40 m (2.5 ha) with cemeteries at the periphery of the settlement site. Buildings vary in size and arrangement without an overall plan. Construction was of local stone with clay mortar in places. In areas of wall collapse, some soil discolorations suggested that portions of the wall may have been built utilizing mud-brick.[1238] Diagnostic pottery dates the use of the site from Late Minoan IIIC continuously into the Protogeometric period.[1239] Pottery firmly dated to Late Minoan IIIC with parallels from Kastri, Karphi, and the Spring Chamber at Knossos have been recovered from several deposits: from building A; two conical cups, a shallow dish, a tripod vessel, and from Room B3; two nearly complete kylixes, and a carinated bowl with a short straight stem; as well as additional ceramics from room B4.[1240] Building E had significant deposit of coarseware which suggested occupation until Middle Protogeometric. Piles of stone mixed with ashy soil, burned human bones, fineware dated to Late Geometric, jewellery (fibula), and iron arrowheads were found in the southwest corner of trench 12400 which ran through rooms C2 and D2 and in room E3 (trench 800). Beneath the ashy soil in this trench was hard packed red soil. From this evidence the excavators concluded that the site was used for habitation until Middle Protogeometric, thereafter abandoned and used solely for cremations into the Late Geometric.[1241]

[1237] Day, Coulson, and Gesell 1986, 355.
[1238] Day, Coulson, and Gesell 1986, 385.
[1239] Day Coulson, and Gesell 1986, 364-5 do note some Middle Minoan pottery, a clay sealing (Fig. 6), and one Neolithic ax-head found on bedrock but noted that there was no evidence of Middle Minoan architecture, just these few finds.
[1240] Day, Coulson, and Gesell 1986, 363-71, Fig. 4, items 4,5 conical cups, item 6 shallow dish, item 7 tripod, Fig. 7, item 7 kylixes.
[1241] Day, Coulson, and Gesell 1986, 371, 382, 385, 387. LG vessels included one with compass drawn concentric rings (Fig. 5: 26a-c), one with hatched meander (Fig. 5: 27), 2 cups (Fig. 14: 42,43) with parallels from Fortetsa and Knossos.

Kastro is perched on a mountaintop 800 m directly south and above Azoria (only 700 m south of Azoria but 470 m higher). Vronda is one km to the southwest.[1242] Boyd described the site as an "almost inaccessible height."[1243] The settlement consists of thirteen contiguous rooms on the top of the peak and several other buildings arranged below on six different terraces comprising a total area of about 3 ha (see Fig. 9.7). The height and inaccessibility of the site gives a visual impression like Karphi and Vrokastro.[1244] The site is only approachable along the ridge to the south. There is access to a year-round spring to the east. To the north and west are sheer cliffs.[1245] The building arrangement is constrained by the topography. Houses follow the contour of the hill-top and are built into niches and clefts.[1246] The resulting plan is irregular. House construction technique was unchanged from Late Minoan IIIC through to Orientalizing period when the site was abandoned. Building design and construction techniques were the same as observed at other Cretan mountain sites. Houses were arranged axially and were built from local schist with no evidence of mudbrick in the construction.[1247] Clay based mud mortar was evident in places. Walls were footed on bedrock and consisted of two rock faces built with the smoothest side outwards and the most angular to the centre. Wall thicknesses varied between 0.42-0.90 m. Roofs were flat, made of clay and dirt supported by a wooden substructure and ranged in thickness from 0.25-0.35 m thick. The largest span was 4.40 m. The same roof style is observed at other Cretan sites such as Vrokastro and Karphi. Floors were level expanses of bedrock or packed clay and bedrock composite. There was some

[1242] Nowicki 2000, 99.
[1243] Boyd 1901, 137.
[1244] Gesell, Day, and Coulson 1985, 327-9.
[1245] Coulson 1998, 40; Mook 1998, 46; Haggis and Nowicki 1993, n47 noted the quality of the water supply.
[1246] Coulson 1998, 40-3; Mook 1998, 49-56.
[1247] Haggis, Mook, Coulson, and Tobin 1997, 319.

rebuilding and reconstruction done in the Late Geometric period.[1248] Extended terraces were built on the west slope filling in earlier habitation areas.[1249]

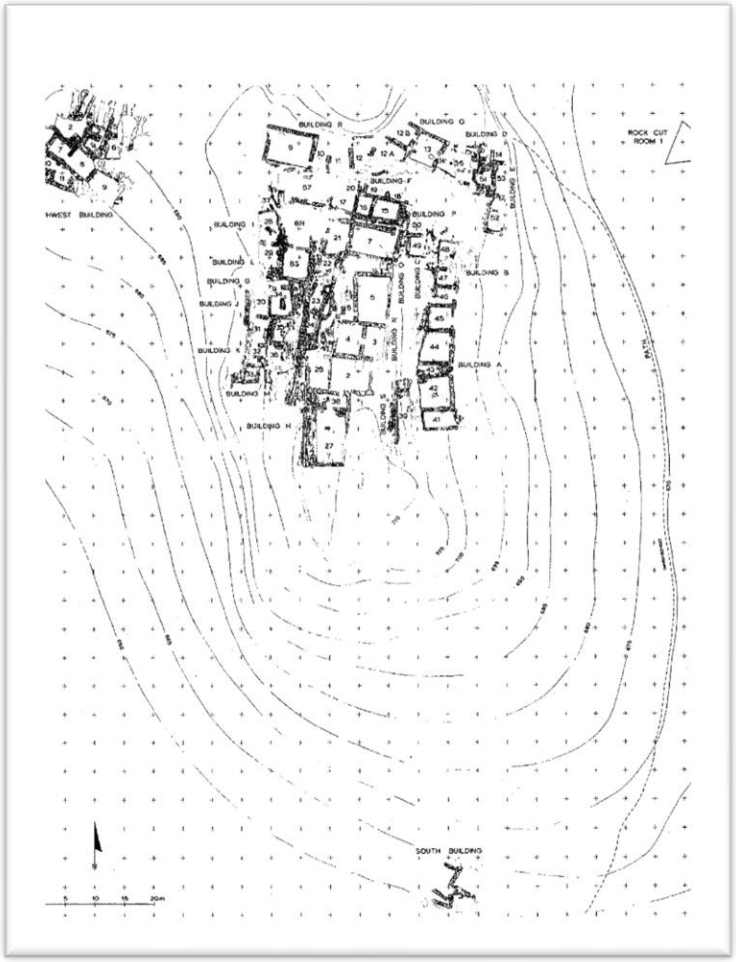


***Figure 9.7 Plan of Kastro. From Haggis, Mook, Coulson, and Tobin 1997, Fig. 1.***

The pottery sequence at Kastro continued longer than at Khalasmeno and Katalimata.[1250] The earliest levels found at Kastro are dated to Late Minoan IIIC, marked with coarse pottery and pithoi fragments.[1251] Pottery forms and motifs

[1248] Mook 1998, 45 in the Northwest house on one of the lower terraces rooms NW 3 and 4 were rebuilt and NW 10 was doubled in size with the addition on NW11.
[1249] Coulson 1998, 41, 43.
[1250] Haggis, Mook, Coulson, and Tobin 1997, 320-2.
[1251] Mook 1998, 45; Gesell, Day, and Coulson 1985, 329.

extend into the Protogeometric period from which there are numerous finds: bases, cup rims, skyphoi, kraters, hydria. Decorative motifs on fineware are cross hatching (K94, K96, K99), concentric semi-circles (K91, K92), zonal separation (K93, K95, K97, K98), and crosshatched diamond and triangle decorations (K49, K50, K51) which also appear from Vronda tomb IX and X.[1252] Late Geometric fineware designs included white paint motifs on black background (K99) as well as incised and painted decorations on coarseware (K115, Fig. 11).[1253] The greatest concentration of pottery was in Room 7.[1254]

Pottery at Kastro end with Early Orientalizing, *c*. mid-7th century.[1255] Houses with signs of occupation from this period were limited to two rooms in the Northwest building, suggesting that the site occupation was much reduced before gradually going out of use. The diminished use corresponds with other locations in the cluster, other than Azoria. There was no cemetery activity at either Vronda or the tombs at Plaï tou Kastrou, Aloni, and Skouriasmenos near to Kastro after the mid-7th century.

## 9.6 Azoria

The site of Azoria was continuously inhabited from Late Minoan IIIC to the end of the Archaic period.[1256] Two distinct phases of Azoria are observable; the first from formation in Late Minoan IIIC until the end of the 7th century when the site was one of a cluster of settlements in the area, and the second from 600 – 475 when it seems to have been the sole settlement site in the area. In the Archaic period Azoria reached a size of 15 ha, five times the area of Geometric period Kastro (see Figs 9.7, 9.10). There was no change in site location between the phases; the

[1252] Gesell, Day, and Coulson 1985, 342-52 for ceramic catalog.
[1253] Gesell, Day, and Coulson 1985, 344.
[1254] Gesell, Day, and Coulson 1985, 345.
[1255] Coulson 1998, 40; Mook 1998, 45; Day, Coulson, and Gesell 1986, 387.
[1256] Haggis 2014, 130.

Archaic buildings were constructed on top of the preceding phase.[1257] Azoria was abandoned *c.* 475 with evidence of a violent terminal destruction.[1258]

Azoria is located southeast of modern Kavousi and northeast of Kastro, about 330 m, at the entrance to a gorge running east towards Ronkaka and beyond to Siteia.[1259] The surroundings to the east are quite mountainous while the view to the west is open to the plain below (see Fig. 9.8). The precipitous summit of Kastro to the immediate south towers over the site. Azoria covered two acropoleis, north and south. A Final Neolithic phase is observable at bedrock levels of the south acropolis as well as some Pre-Palatial remains.[1260] The site of the Early Iron Age settlement seems to have been focused around the south acropolis and the adjoining southwest terrace (see Fig. 9.10). During this period, the site area was about 6 ha, significantly larger than other Early Iron Age sites in the area.[1261]

[1257] Haggis 2014, 126 noted that Azoria was representative of a "discontinuous phase change" in what was distinctly "non-linear development process."
[1258] Haggis 2014, 126, 128; Fitzsimons 2014, 244; Haggis, Mook, Scarry, Snyder, and West III 2004, 390.
[1259] Haggis, Mook, Scarry, Snyder, and West III 2004, 339, 343; Boyd 1901, 150.
[1260] Haggis, Mook, Carter, and Snyder 2007, 668-94 incl. catalog of finds; Haggis, Mook, Scarry, Snyder, and West III 2004, 340 discussed all phases of occupation.
[1261] Haggis, Mook, Carter, and Snyder 2007, 697.

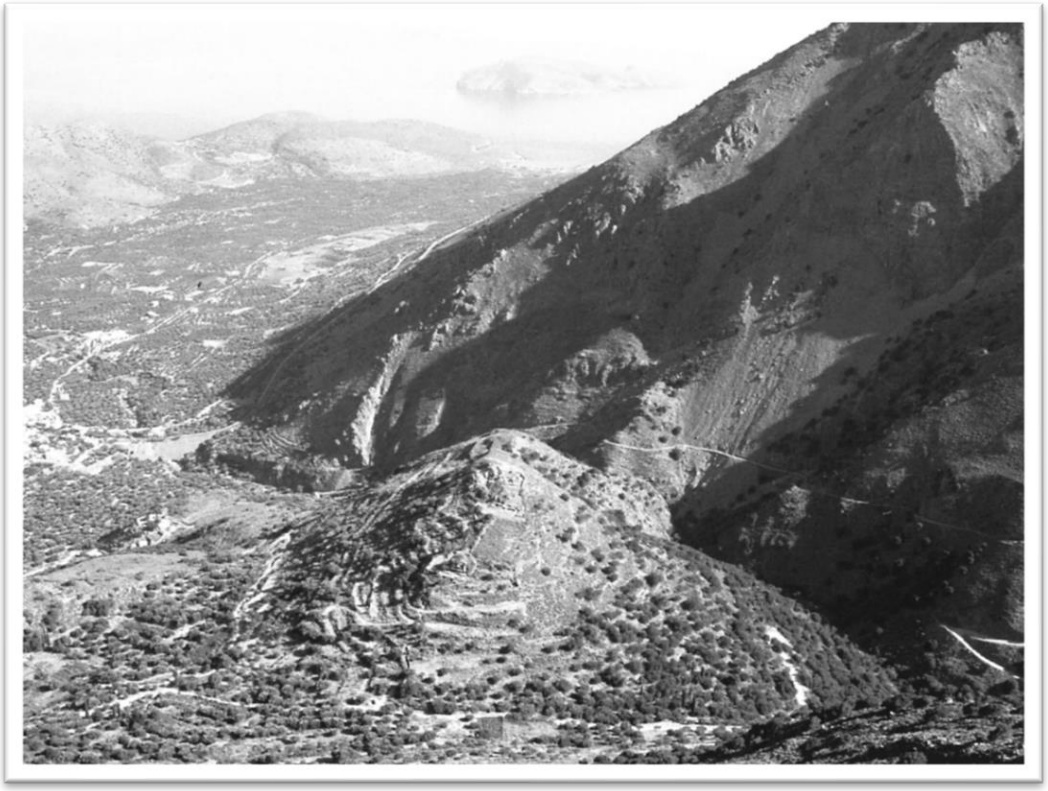

***Figure 9.8 Azoria, photo taken from hill of Kastro. From Haggis, Mook, Scarry, Snyder, and West III 2004, Fig. 2.***

The Early Iron Age buildings were demolished when the Archaic period settlement was built on top of them.[1262] As a result, Early Iron Age construction techniques, room sizes, and room functions were lost. The best-preserved Early Iron Age structure is the Late Minoan IIIC floor surfaces from buildings B1200 and B1700 in the southwest terrace area and several sections of wall along the western slope of the south acropolis (see Fig. 9.9).[1263]

[1262] Haggis, Mook, Carter, and Snyder 2007, 707, 708.
[1263] Fitzsimons 2014, 241, Fig. 7.11; Haggis, Mook, Carter, and Snyder 2007, 697.

***Figure 9.9 Southwestern portion of Azoria, south acropolis. Southwest terrace on lower left.***

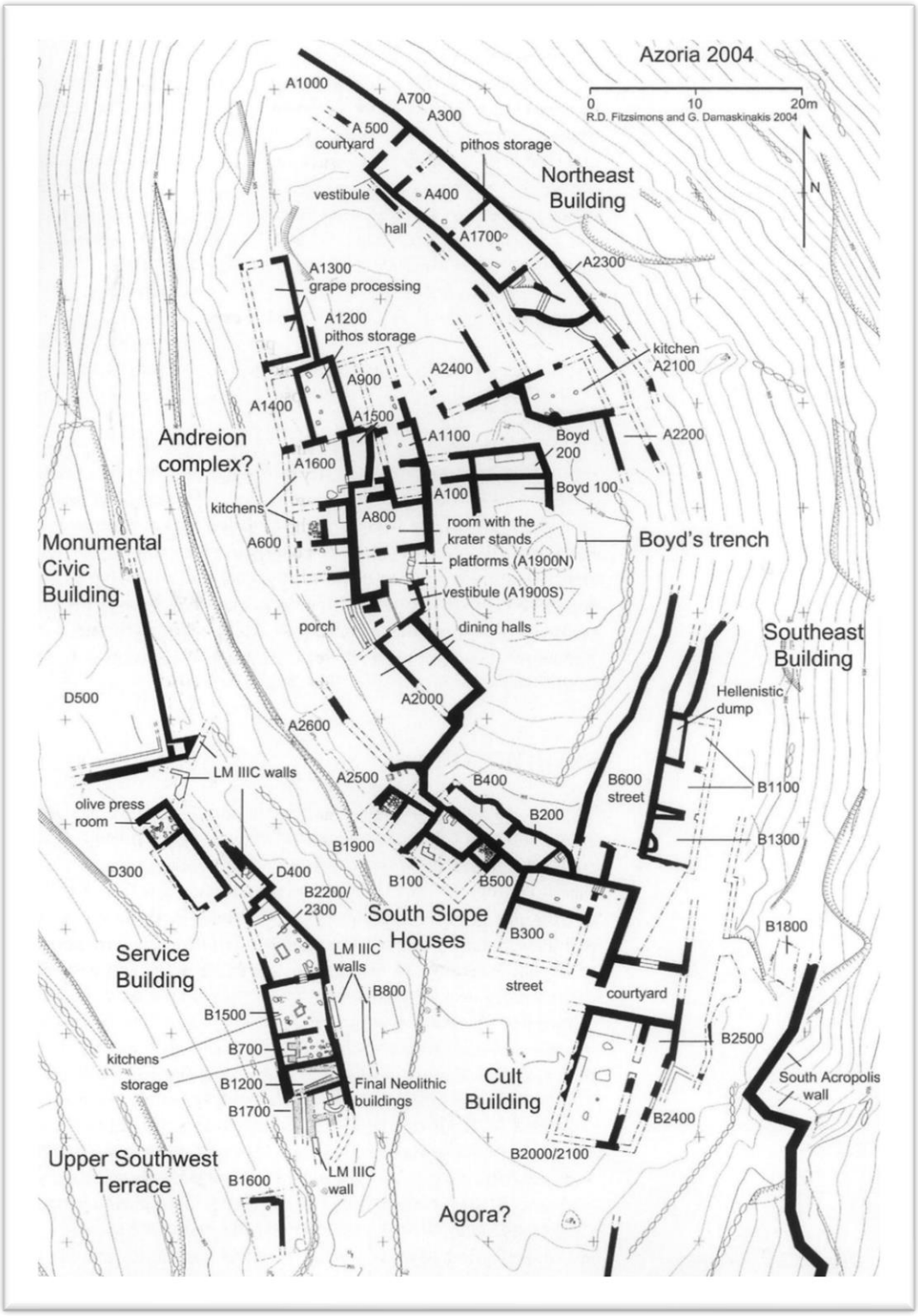


***Figure 9.10 Site Plan of Azoria, Southern Acropolis. From Stefanakis, West III, Haggis, Mook, Fitzsimmons, Scarry, and Snyder 2007, Fig. 1.***

Late Minoan IIIC and Geometric period pottery, while extensive, were recovered mostly from bedrock deposits and in secondary deposits as fill behind spine walls (see Fig. 9.11, photo of spine walls). Consequently, dating had to be deduced from pottery forms and designs rather than stratigraphy.[1264] Late Minoan III pottery closely resembles that from Kastro, Vronda and Khalasmeno. The deep bowl was the most common shape from this period with well levigated fabric and generally slipped and polished.[1265] A krater with spiral motifs and ribbed lekanai are notable.[1266] Late Minoan IIIC three-leg cooking pots and pithoi incised with chevrons and herring bones were among the coarseware finds.[1267] Protogeometric pottery consisted mostly of dipped bell skyphoi.[1268] Late Geometric pottery was best represented by black monochrome cups, dipped with rims 11-14 cm in diameter.[1269] The consistent presence of Protogeometric to Late Geometric ceramic material throughout the foundation deposits created by the Archaic period reconstruction, indicate that Azoria was a substantial Early Iron Age settlement.

As mentioned above, about the end of the 7th century the site of Azoria was completely rebuilt in a manner that redefined and restructured the domestic and communal spaces.[1270] The Early Iron Age built structures of Azoria were nearly completely levelled in the construction of extensive terraces that reshaped the south hill. The fill material from the Early Iron Age levels was over a meter deep in some areas. Long spine walls, roughly parallel to one another and roughly

[1264] Haggis, Mook, Carter, and Snyder 2007, 696, pottery cataloged 702-5; see also Haggis, Mook, Scarry, Snyder, and West III 2004, 365-6, 375 for room locations of specific LMIIIC deposits.
[1265] Haggis, Mook, Carter, and Snyder 2007, Fig. 32, items 1-9, 12-17.
[1266] Haggis, Mook, Carter, and Snyder 2007, Fig. 32, items 20-22.
[1267] Haggis, Mook, Carter, and Snyder 2007, Fig. 33, items 1, 4, 5-7.
[1268] Haggis, Mook, Carter, and Snyder 2007, Fig. 34, items 1-3.
[1269] Haggis, Mook, Carter, and Snyder 2007, Fig. 34, items 5-8.
[1270] Haggis 2014, 126.

concentric about the hill, formed a framework for building the new settlement.[1271] The spine walls resemble support walls for terracing and are robust structures built to a heavier standard than the room walls that radiate out from them (see Fig. 9.11).

***Figure 9.11 Spine wall and room walls radiating off the dominant spine structure. Southwestern Azoria.***

Houses were physically integrated into the spine walls yet retained the basic axial alignment and were built in concert with the vagaries of the topography utilizing bedrock formations and various niches and crevices in the bedrock.[1272] House sizes were larger at Archaic period Azoria than at Geometric period Vronda and Kastro;

[1271] Spine wall construction technique is observed at other Cretan sites such as Lato and Oleros, see Haggis, Mook, Scarry, Snyder, and West III 2004, 351; Haggis, Mook, Fitzsimons, Scarry, and Snyder 2011, 432 on spine walls at Azoria.
[1272] Haggis 2014, 127-9; Fitzsimons 2014, 226-7, 230, 237-8; Haggis, Mook, Carter, and Snyder 2007, 696-702; Haggis, Mook, Scarry, Snyder, and West III 2004, 346, 364.

the largest house at Vronda (N2-N3-N5) was 82.9 m² whereas the northwest building at Azoria was 144 m² and, if the two courtyards A500 and A1800 and adjoining kitchen room A2100 are included, the area was 260 m².[1273] The clay and bedrock floors were renewed but the building forms remained fixed for the life of the Archaic period settlement.[1274] Building materials of local stone, clay, and extensive use of the bedrock, remain unchanged from the Early Iron Age but the building technique was different.[1275] The best-preserved example comes from the Northwest building D700 and D1500 where the east wall is preserved to a height of 4.0 m.. The floor of the building was shaved bedrock and clay fill. The bedrock was dressed to form the lower part of the wall above which smaller dolomite, phyllite (schist), and sideropetra (grey crystalline limestone) stones were arranged to form a tight packed face with smaller stones inserted into the gaps. The wall was built in a series of discrete sections, two courses at a time, a common feature throughout the site. The spine walls were built up from a bedrock ledge, utilizing large and medium sized dolomite boulders to a height of 1.55-1.70 m. Additional rough courses of smaller dolomite stones were added above. The sections were marked by vertical and horizontal seams of which three segments together seem to have formed a single structural unit. This technique is seen throughout the settlement where wall heights are preserved such as the east wall of the Monumental Civic Building (D205) and the upper terrace in the Communal Dining Building (A602) (see Fig. 9.10).[1276] This standardization of technique and the building scale suggests to the excavators that this was a product of organized and

[1273] Fitzsimmons 2014, 230.
[1274] Haggis, Mook, Fitzsimons, Scarry, and Snyder 2011, 439, 477.
[1275] Haggis, Mook, Fitzsimons, Scarry, and Snyder 2011, 449.
[1276] Stefanakis, West III, Haggis, Mook, Fitzsimmons, Scary, and Snyder 2007, 295-8.

managed labour, different from the Early Iron Age house construction where the techniques employed suggested that each house was built by its inhabitants.[1277]

The Archaic site design added several large communal spaces that were not observable in the Early Iron Age settlements in the Mirabello region previously considered. These spaces were utilized for the communal consumption of large quantities of food and drink. Large joints of sheep and goat bones, iron spits, large serving vessels, cups and kraters were among the remains found on the floor of the communal spaces.[1278] A large dining hall (termed Andreion) on the west slope, upper terrace (A2000) measured 9 m by 3 m, 27 m². It was connected to storerooms and kitchens on the lower terrace (A600, A1200, A1400, A1500). Food debris consisting of olive stones, grape pips, pulses, pistachio shells, fig and poppy seeds were found, as well as a significant assemblage of dining ware consisting of cups, jugs, kraters, and terracotta stands.[1279] On the southwest terrace was the larger Monumental Civic Building with an area of 180-200 m².[1280] This was supported by a string of service buildings immediately to the south including storage (B700), food processing (B2200/2300), and a kitchen (B1500). Significant finds of coarse cooking-ware and fineware cups, skyphoi and kraters including several Attic items were uncovered. Food debris remnants included pig, rabbit, sheep, goat, and cow bones as well as marine shells.[1281] The dimensions of the structures and multiple adjacent spaces devoted to food production and storage

[1277] See Fitzsimmons 2014, 226 and Haggis, Mook, Fitzsimmons, Scarry, and Snyder 2011, 477-82 on social factors at Azoria evidenced by standardized construction; Mook 1998, 56 suggested that the houses of Kastro were built by their inhabitants; Coulson 1998, 43 thought the LG terracing at Kastro indicated central authority.
[1278] Haggis 2014, 131-2, the burnt 5th c. destruction preserved numerous organic remains.
[1279] Stefanakis, West III, Haggis, Mook, Fitzsimons, Scarry, and Snyder 2007, 253-63. It is suggested that one cup may have been from Thasos, n41.
[1280] Stefanakis, West III, Haggis, Mook, Fitzsimons, Scarry, and Snyder 2007, 274-301.
[1281] Haggis, Mook, Scarry, Snyder, and West III 2004, 386.

suggest that these spaces operated at a scale greater than an individual household.[1282]

Ceramic assemblages from the Archaic levels were numerous.[1283] They consisted in greatest volume of coarseware mostly related to food production, cooking, and storage pithoi concentrated in the storerooms and kitchens associated with the communal dining spaces mentioned above. Few transport amphorae have been found. Fineware consisted of the expected assemblages of cups, skyphoi, and other shapes commonly associated with drinking. Most ceramic items appear to have been of local production. Noteworthy were two pithoi of Cretan construction found in room B300 corridor against the north wall; one dated to Archaic period and the other to Late Minoan IIIC - decorated with incised chevron bands and rope decorations, an heirloom of over 700 years antiquity.[1284]

Imports of ceramics were not plentiful. Imports from Attica has been noted above, in addition a type of cookware from Aegina was found in several rooms.[1285] A cup or skyphos may be from Thasos.[1286]

## 9.7 Summary of Azoria Cluster

The cluster of settlements around Azoria showed evidence of several notable developments between 1100 – 500. Of note was the establishment of new settlements in the region during Late Minoan IIIC. These settlements lacked

[1282] Fitzsimons 2014, 237.
[1283] Haggis, Mook, Fitzsimons, Scarry, and Snyder 2011, 441-51, 454-60, 466-7; Stefanakis, West III, Haggis, Mook, Fitzsimons, Scarry, and Snyder 2007, 260, 283, 298; Haggis, Mook, Scarry, Snyder, and West III 2004, 365-6, 375, 380.
[1284] Haggis, Mook, Scarry, Snyder, and West III 2004, 354, Fig. 8, n47.
[1285] Haggis, Mook, Fitzsimons, Scarry, and Snyder 2011, noted an Aeginetan chytra in room D1300 p.442, room D1500 p. 445, 447, room B3600 p. 454, Room B3800 p.460, n26 noted the fabric of these examples.
[1286] Stefanakis, West III, Haggis, Mook, Fitzsimons, Scarry, and Snyder 2007, 260, Fig. 14:5, n41 described similar designs found at Olous and Itanos.

Minoan antecedents and could largely be characterized as refuge sites. They were small in area and appeared to have existed with a pastoral/agricultural economic platform. There is little evidence of contact outside of the region. The people nucleated in Kastro and Azoria between the Protogeometric and the Geometric periods, sites arguably more defensively sited than Vondra and Khalasmeno. Architectural forms and construction methods were the same at each site examined with rooms arranged axially.[1287] Moreover, the forms were static throughout this period across each site. About the end of the 7th century, a major discontinuity occurred with the abandonment of Kastro and the cemeteries around Vronda, and the apparent consolidation of the region's population into a larger site at Azoria. This consolidation took on the appearance of a different social construct evidenced by the erection of large communal buildings, standardization of a new building technique, and evidence of large-scale communal feasting. Azoria was not a Bronze Age palace, nor was it a *polis*, but neither was it a refuge settlement.[1288] The imported ceramics may be indicative of contact beyond the immediate region, but the paucity of these items compared to locally produced pottery should be noted.[1289]

The excavators commented on the absence of primary agricultural production facilities at Azoria, particularly the lack of by-products from grain threshing.[1290] At Geometric Kastro, there had been considerable evidence of wheat chaff on the

[1287] Fitzsimmons 2014, 222 suggests that the axial house design continued to be the norm on Crete into the 4th c whereas mainland Greece had turned to a courtyard house design.
[1288] Haggis 2014, 120.
[1289] Boyd 1901, 146 in a tholos tomb at Skouriasmenos found "fragments of the so-called Egyptian porcelain seem to indicate transmarine connections." This tomb had disturbed stratigraphy, so the periodization is uncertain although there were examples of what Boyd termed Geometric pottery.
[1290] On distant agricultural production see Haggis, Mook, Fitzsimons, Scarry, and Snyder 2011, 483-5; Haggis, Mook, Scarry, Snyder, and West III 2004, 392. Stefanakis, West III, Haggis, Mook, Fitzsimons, Scarry, and Snyder 2007, 294 noted a small oil production facility within Building D300.

floors, but this was not the case for Archaic period Azoria.[1291] Azoria also lacked facilities for wine production and large-scale oil production. It has been proposed that primary production occurred outside of the settlement and the finished products were brought back to the site, perhaps evidenced by the increased area devoted to food storage within the settlement. This interpretation seems logical but is not archaeologically attested as remote agricultural processing facilities have not been found.

The economic platform of Archaic period Azoria appears to have remained pastoral/agricultural albeit probably larger in scale and efficiency. Moreover, what is not found is evidence of an additive economic plan. Loom weights were found in several rooms but probably not enough to suggest export textile production took place.[1292] Room A1200 produced some evidence of iron slag but the remains of seven pithoi suggest the room was principally a storage place rather than a site of metal working.[1293] The site location itself did not change and was no more accessible in 500 than it had been in 1100.

The social construct at Azoria arguably changed and probably significantly in the context of nascent urbanization, evidenced by the new construction techniques and communal room sizes in the Archaic period reconfiguration of the settlement.[1294] Economically, Azoria seems to fit the economic model from Chapter 1 when population growth and economic growth are equal with little diachronic change in per capita incomes.

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[1291] Haggis, Mook, Fitzsimmons, Scarry, and Snyder 2011, 483.
[1292] Stefanakis, West III, Haggis, Mook, Fitzsimons, Scarry, and Snyder 2007, 288, n141 commented on the probable local scale of textile production; Haggis, Mook, Scarry, Snyder, and West III 2004, 371-2, Fig. 24.
[1293] Haggis, Mook, Scarry, Snyder, and West III 2004, 375-6.
[1294] Haggis 2014, 137-8; Fitzsimons 2014, 230-1.

# 10 Appendix D: Estimating Population

## 10.1 Diachronic Population Dynamics

As discussed in Chapter 4, section 4.7, estimating population levels before accurate census records is challenging. Multiple approaches utilizing a variety of surrogates preserved in the archaeological record have been attempted. These methodologies will be briefly reviewed before making estimates of population levels in the Cyclades.

Snodgrass utilized evidence from Geometric burials in Attica and the Argolid to assess changes in population dynamics (see Fig. 10.1).[1295]

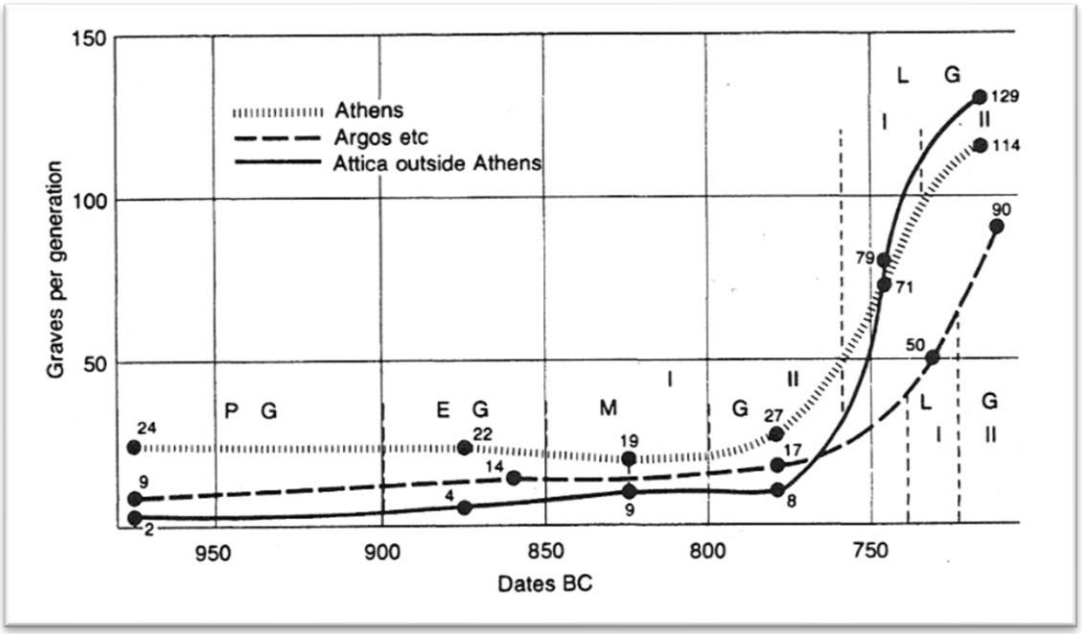


***Figure 10.1 Graves per generation from Athens, Attica, and Argolid. From Snodgrass 1980, Fig. 4.***

[1295] Snodgrass 1980, 22-5, Figs 3, 4.

Between about 950 and 700, the number of graves increased by a factor of nearly 6.5 on average ((333/3) / (52/3)). If we consider the range from 775 to 700 the increase was closer to nine and one half-fold. There are some problems with this methodology in that it assumes rising burials reflects rising population. However, this is not universally true such as during periods of plague when a rise in burials may reflect a decrease in population.[1296] Nor are burial practices consistent over time. Morris noted that child burial practices changed several times during the period Snodgrass examined.[1297] In the Cyclades, there is no burial evidence of sufficient duration to make the types of assessments Snodgrass made.[1298]

Scheidel and Murray utilized mathematical metrics to try and reduce the statistical uncertainty behind estimates.[1299] Both assumed a population for Greece in the Classical period of two million and used this as basis for analysis, running a series of growth rate factors (.25%, .30%, .35%, .40%, .45%) that were then modelled to find a best fit scenario for reasonable population estimates for other periods. If the population in Classical Greece was other than two million, their growth rate calculations would need to be adjusted to remain reasonable. The beginning assumption is uncertain; Herman Hansen suggested four million for the Classical population.[1300]

Another approach utilized by Starr, was to consider food productivity in a region and the population that could be supported by it.[1301] Somewhat analogous is using trade goods as a rough surrogate, more items suggests a larger population than

[1296] Murray 1993, 65.
[1297] Morris 1987, 18-22; Sallares 1991, 86-90, 122-9 and Tandy 1997, 23-4, 46-58 offered nuanced interpretations of the burial data.
[1298] D'Onofrio 2014, 100 the Kerameikos was in continuous use from the final phases of the LBA through and beyond the Classical period. There is no cemetery with that duration of use in the Cyclades; see also Knigge 1988.
[1299] Scheidel 2004; 2003; Murray 2017, 233-8, Table 5.1.
[1300] Herman Hansen 2006a.
[1301] Starr 1977, 40-6; also Herman Hansen 2006a, 43-5.

does fewer goods.[1302] Lastly, in a non-archaeological methodology, Herman Hansen considered the ancient written evidence regarding the population of warriors or rowers engaged in a particular encounter to then project back a total population estimate.[1303] Herman Hansen's technique is discussed in further detail below.

Changes in the number of settlement sites and estimates of population density within settlements was utilized by Morris, Renfrew, and others in population estimates.[1304] While tabulating the number of sites and the houses within a site that has been well excavated is seemingly straightforward, estimating the population density is not, nor does site evidence account for the percentage of population that lives outside of excavated sites in rural or pastoral environments.[1305] The archaeologically unaccounted for population could be significant. Renfrew in a new Introduction (2010) to *The Emergence of Civilization,* noted that his previous estimates of density failed to give proper attention to the range of site sizes.[1306] Settlement sites that have been identified, but not excavated, is a further complication.

## 10.2 Developing a Model

Like a good navigator who never relies on one method but rather uses several techniques to plot a ship's position, the best approach is arguably to utilize several methodologies, compare them, and arrive at a considered estimate taking into account the strengths and weaknesses of the various approaches used.[1307] In this

[1302] Murray 2017, 212-14.
[1303] Herman Hansen 2006a; Morris 1987, 99-100.
[1304] Renfrew 2011; Green 1990; Morris 1987; Desborough 1972; Snodgrass 1971.
[1305] Sites such as Koukounaries and Ag. Andreas are straightforward, surveyed but not excavated sites more problematic such as Oikonomos and Detis (see Figs 4.34, 4.25, 4.41, 4.42); Morris 1987, 100 used spatial area and density estimates corroborated with number of graves to estimate the population of 5th c. Athens.
[1306] Renfrew 2011, XXXIII.
[1307] Herman Hansen 2006a, 20 on 'shotgun method.'

Appendix we will consider the number of settlement sites, population density estimates per site, comparanda with other periods for rate of growth estimates, and a notion of the holding capacity of the land, to arrive at a population estimate for the Late Archaic Cyclades. Such an exercise is based on multiple admittedly unverifiable assumptions making the estimate speculative. It is incumbent therefore to provide transparency so that the assumptions made are visible for alternative interpretations. The standard utilized is to consider the degree of reasonableness and to consider the impacts of alternative assessments, some assumptions create a greater impact than others. A map of Archaic settlement sites is reprinted for convenience.

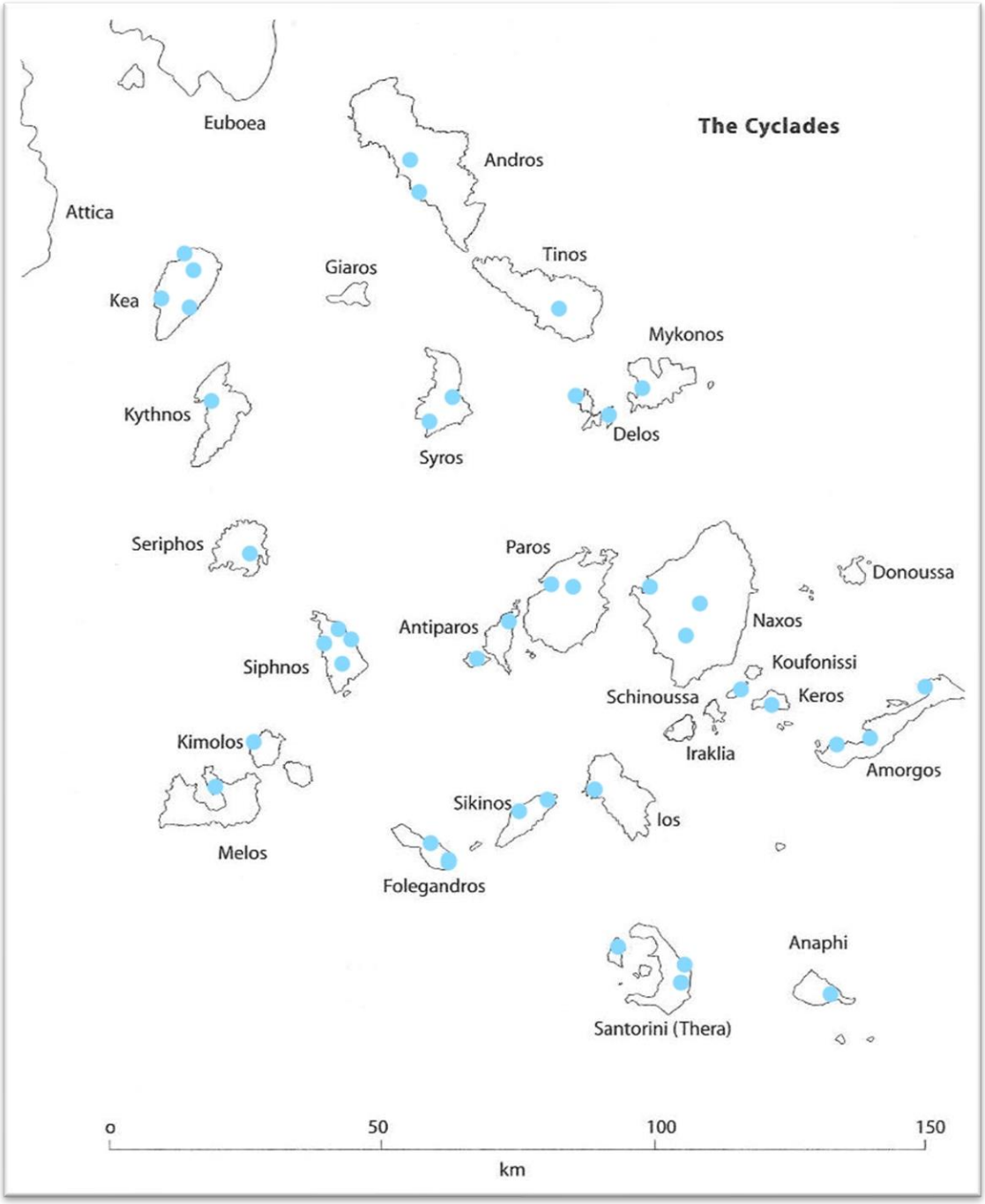


***Figure 10.2 Settlement cites at end of Early Archaic Period c. 600, repeat of Fig. 4.135.***

Herman Hansen and Figueira both applied literary evidence from Herodotus (Hdt. 8.46) that the Aeginetans supplied 30 ships at Salamis plus kept some in reserve to defend the island. Herman Hansen suggested a total fleet of 45 triremes with a crew of 200 each, for a total of 9,000 sailors. Figueira used 50 triremes with a total crew of 10,000 in his calculation, which he considered all the men available. Figueira assumed a 50/50 male/female ratio, projected an average life expectancy of 25 years, to estimate a total population for Aegina of 42,000.[1308] Herman Hansen, applying a reasonableness factor, claimed this population level was too high for the island to support; it represents a population density over the entire island of more than 500 per km². Herman Hansen suggested that Aegina must have hired sailors from elsewhere to help man a fleet of 45 to 50 ships.[1309] Herman Hansen's own calculation suggested a total population for the island of between 14,000 to 20,000, for an island wide density of 164.7 to 235.3/km².[1310] Herman Hansen argued the population density within the housing area of the *polis* of Aegina was 250/ha², and that 80% of the area was for used for habitation, leaving 20% open space for an average of 200/ha².[1311] He estimated the extra-urban population at 33% of the urban population.[1312] Critical assumptions by Herman Hansen in his estimates of population density were: determining the area within a settlement used for housing, the density factor used within the urban housing area, and calculating extra-urban population as a percentage of urban population.

[1308] Figueira 1981, 37-8.
[1309] Herman Hansen 2006a, 12.
[1310] Herman Hansen 2006a, 11-12; Horden and Purcell 2000, 119 suggested 35,000, 410/km², a seemingly impossible figure.
[1311] Herman Hansen 2006a, 8 He notes that Aegina was more densely inhabited than other poleis where a 50/50 ratio between housing and open space would be appropriate.
[1312] Herman Hansen 2006a, 8, n14 30-33 houses per ha of inhabited space with 5-6 persons per household.; Bennet 2007, 187 examining Late Bronze Age Mycenae, applied the same factor of 200/ha² in calculating the population within the fortifications.

To apply these concepts to the Cyclades we need sites where the urban areas can be clearly delineated, are well enough excavated to allow determination between private housing and common spaces, and are 'full' in the sense that people living there were actively occupying the entire settlement and not living in a corner of an ancestral settlement. Three candidates fit these criteria: Aghios Andreas on Siphnos, Hypsili on Andros, and Ancient Thera.

Aghios Andreas has been excavate by Televantou (see Section 4.2.5, Fig. 4.25). The settlement had a Late Bronze Age foundation, was abandoned at the end of the 12th or early in the 11th century, was fully repopulated by second half of 8th century with continuous usage to early 5th century.[1313] Most recent work has focused on the sanctuary area within the walls.[1314] About 95 structures within the walls could be considered houses. Routes through the settlement flow logically from Gates I, II, and III. The high point of the settlement is bare rock. The later church of Aghios Andreas is within the settlement and may have covered additional housing. The ancient sanctuary enclosed by a peribolos, covers earlier structural walls. From aerial photography, the total area enclosed is 0.85 ha with housing occupying 0.53 ha, 62%.

Hypsili on Andros was also excavated by Televantou (see Section 4.4.1, Fig. 4.93). The settlement was founded about 925 at the end of the Protogeometric period. Around 700, some of the population moved away, presumably to the newly formed eventual *polis* centre of Palaeopolis to the south. After 700, all the population concentrated within the walls. The settlement was greatly reduced by the end of the Archaic period.[1315] Excavated housing area is concentrated in the centre and east within the fortifications. The western area within the fortifications

[1313] Televantou 2008a, 42-3, 64-6.
[1314] Televantou 2017.
[1315] Televantou 2012, 83; 2008, 56, 61-2.

has not been excavated.[1316] A sanctuary in the centre of the settlement covered an area roughly 450 m². About 68 possible housing units can be identified. Modern buildings and agricultural uses have impacted the site.[1317] Determined by aerial photography, the total area within the walls is 0.87 ha, the area covered by building is 0.57 ha, 66%.

Ancient Thera is not surrounded by a fortification wall but rather is laid out along the crest of a steep ridge protected by sheer 300 m cliffs on three sides (see Section 4.5.1, Fig. 4.118). The settlement was founded late in the 9th or possibly early in the 8th century. Building remains date from the Hellenistic period. Given the restricted topography, the later buildings were plausibly built over earlier Archaic and Classical foundations.[1318] Thera was excavated by Von Gärtringen from 1895 - 1903. The total site area covers nearly 7 ha as it stretches out to the Sanctuary of Apollo Karneios. The central area of the wide spot on the ridge where the settlement is centred covers 4.35 ha of which housing covers slightly less than half, 2.0 ha., 46%. As a very rough estimate from Fig. 4.118, about 150 structures could have been residences. Hellenistic Thera has several open courtyard areas bordered by public buildings making the determination of housing structures speculative.

Table 7 below summarizes the data and makes calculations of density per ha for the settlement as a whole and the for living area within the settlement using three different assumptions on number of persons per house:

[1316] Televantou 2008a, 56.
[1317] Televantou 2012, 85; 2008, 57, 66-7.
[1318] Sperling 1974, 326.

***Table 7 Determination of Population Density***

| Settlement | Total Area in ha | House Area in ha | No. Houses | Pct. Area Covered by Housing | Population of Settlement at three different density per house factors | | |
|---|---|---|---|---|---|---|---|
| | | | | | 10/house | 6/house | 4/house |
| Aghios Andreas | 0.85 | 0.53 | 95 | 62% | 950 | 570 | 380 |
| Hypsili | 0.87 | 0.57 | 68 | 66% | 680 | 408 | 272 |
| Thera | 4.35 | 2.0 | 150 | 46% | 1500 | 900 | 600 |
| | Number of people per ha of total area at three different density per house factors | | | | Number of people per ha of housing area at three different density per house factors | | |
| | 10/house | 6/house | 4/house | | 10/house | 6/house | 4/house |
| Aghios Andreas | 1118 | 671 | 447 | | 1792 | 1075 | 717 |
| Hypsili | 782 | 469 | 313 | | 1193 | 716 | 477 |
| Thera | 345 | 207 | 138 | | 750 | 450 | 300 |

Testing Herman Hansen's assumptions against the data from these three Cycladic sites suggests several observations:

1. The percentage of settlement area occupied by housing was lower in all cases than the 80% factor used for Aegina.
2. Population density per ha both for the total site area and for the housing area are higher than 250 per ha by several orders of magnitude, arguably nonsensical. Yet the total population for each of the settlements under each of the scenarios does not seem unreasonable.
3. This analysis neither supports nor contradicts the validity of using urban density to calculate extra-urban populations.

Observations independent of Herman Hansen's model:

1. The location of hilltop fortifications walls is determined by site topography. Walls can only be built where adequate supporting strata can be found. Walls surrounding a settlement on a flat plain are not similarly constrained and can be built to suit the inhabitant's requirements more readily. The walls of Aghios Andreas and Hypsili follow constrained topography in several places. This may have led to smaller settlement areas and consequently greater density. Extensive housing located outside but adjacent to the fortifications at Hypsili has been excavated.

2. It was discovered by the author that counting individual houses from site maps is extremely difficult. Determining a general area of housing and applying a density factor seems a reasonable approach.
3. A correlation between urban population and extra-urban is hard to find. Case by case area-wide evaluation of suitable extra-urban farm area, pastoral ranges, and non-productive area seems a better way forward. If an urban center is located in a port area while the best farmland is elsewhere as is the case for Andros, Kythnos, and Melos, or if an island has a large hinterland such as Naxos, the rural density should be considered differently than if the main urban area is located within the farming region as on Keos, Paros, and Siphnos.

These principles were considered in constructing Table 8:

***Table 8 Application of Population Model***

| Population Density For Selected Sites | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Island | Polis | Area m² | Area HA² | Urban pop. @ 230/ha² | Rural pop. | Pct. of pop. rural | Total Population | |
| Single *polis* Islands | | | | | | | | |
| Paros | Paroikia | 814,489 | 81 | 18,733 | 7,493 | 40% | 26,227 | |
| Naxos | Chora | 758,553 | 76 | 17,447 | 17,447 | 100% | 34,893 | |
| Delos | Delos | 680,814 | 68 | 15,659 | 1,566 | 10% | 17,225 | |
| Andros | Palaeopolis | 335,570 | 34 | 7,718 | 2,547 | 33% | 10,265 | |
| Melos | Palaeopolis | 200,722 | 20 | 4,617 | 3,693 | 80% | 8,310 | |
| Kythnos | Vrykastro | 163,385 | 16 | 3,758 | 1,879 | 50% | 5,637 | |
| Thera | Thera | 53,745 | 5 | 1,236 | 927 | 75% | 2,163 | |
| Tenos | Xobourgo | 8,080 | 1 | 186 | 279 | 150% | 465 | 105,184.17 |
| Multiple *poleis* | | | | | | | | |
| Keos | Ioulis | 53,018 | 5 | 1,219 | 488 | 40% | 1,707 | |
| Keos | Karthaia | 33,317 | 3 | 766 | 307 | 40% | 1,073 | |
| Keos | Koressos | 81,673 | 8 | 1,878 | 751 | 40% | 2,630 | |
| Keos | Poieessa | 22,232 | 2 | 511 | 205 | 40% | 716 | 7,877.54 |
| Amorgos | Aegiale | 12,732 | 1 | 293 | 97 | 33% | 389 | |
| Amorgos | Minoa | 12,069 | 1 | 278 | 92 | 33% | 369 | |
| Amorgos | Arkesini | 11,857 | 1 | 273 | 90 | 33% | 363 | 1,400.59 |
| Siphnos | Aghios Andreas | 11,070 | 1 | 255 | 84 | 50% | 339 | |
| Siphnos | Kastro | 28,073 | 3 | 646 | 213 | 50% | 859 | 1,495.48 |
| | | | | 75,472 | 38,156 | | | |
| | | Total Farmland | Urban Area | | | | | |
| Other Islands | | | | | | | | |
| Siphnos | | 1,330 | 3.0 | 690 | 207 | 30% | 897 | |
| Kimolos | | 1,021 | 3.0 | 690 | 345 | 50% | 1,035 | |
| Syros | | 2,430 | 3.0 | 690 | 138 | 20% | 828 | |
| Ios | | 600 | 3.0 | 690 | 138 | 20% | 828 | |
| Sikinos | | 230 | 3.0 | 690 | 138 | 20% | 828 | |
| Folegandros | | 440 | 3.0 | 690 | 138 | 20% | 828 | |
| Anaphe | | 326 | 3.0 | 690 | 138 | 20% | 828 | |
| Lesser Cyclades | | 2,000 | 3.0 | 690 | 138 | 20% | 828 | 6,900 |
| | | | | 5520.0 | 1,380 | | | 122,857.78 |

The assumptions made in the construction of Table 8 are delineated below.

1. Urban density was calculated using a factor of 230/ha². This factor was derived from the evaluation of Thera in Table 7. The population density per total area was used taking the average of the 10, 6, and 4 people per house calculation which equaled 230.[1319] Like Thera, the single and

[1319] One third of the houses would have had 10 inhabitants, one third 6, and one third 4.

multiple *poleis* were not tightly constrained by fortification walls making the Thera analysis the most analogous. For the 'Other Islands' without measurable *polis* areas, the size of Karthaia was applied uniformly (3 ha), using the same factor of 230/ha².

2. To determine population outside the *polis*, a range of factors were considered based on individual island's land characteristics. These were multiplied against the urban population to get a total island-wide population. The below comments are arranged as per Table 8.
    a. Paros town is surrounded by good farmland. This, combined with the abandonment settlements in areas with good farmland to the north in the mid-7th century, suggest population concentration at the *polis* center.
    b. Naxos has good farmland to the south of Chora extending along the coast plus a large inland area where considerable cult and burial evidence has been noted. A larger than average extra-urban population is suggested.
    c. Northern Delos is mostly covered by sanctuary and settlement remains. The southern part of the island consists mostly of bare rock, poorly suited for agriculture. Consequently, only a small extra-urban population was considered.
    d. Andros has very little Archaic period evidence of activity outside the *polis.* This changed in subsequent periods when iron mines were exploited in the north.
    e. Melos is analogous to Naxos with a range of resources throughout the island; a higher rural factor was applied.
    f. On Kythnos most other areas of activity were in the north proximate to Vrykastro. Rural activity increased in the Classical period with iron mining.
    g. Thera Town is in an isolated, hard to access location. The volcanic soil of the island was agriculturally productive suggesting a scattered rural environment.
    h. Tenos is complicated by the small excavated area of Xobourgo. If the full extent of the *polis* were known the factor could be adjusted but to get a sensible total population estimate a large multiple was used.
    i. The multi-*poleis* islands have a different outlook in that *poleis* are located across the landscape rather than concentrated at a single site. This suggest field workers could reside in an urban environment and still have reasonable access to their land. This pattern was suggested by Mendoni's 1994 survey on Keos.
    j. On the 'Other Islands,' slight adjustments were made to Kimolos and Seriphos reflecting different land use patterns from the

> smaller islands where nearly every part of the island is easily accessible within a day's walk.

The data presented in Table 8 seems logical in most cases. Tenos is probably under-reported despite the large rural factor applied. Siphnos also seems too low given the number of mines being worked, the watch towers and the two forts. The total population estimate is rounded up to 123,000.

For comparison, the population of the Cyclades in 1896 CE was 134,750, (from Philippson 1898) and in 1940 was 129,015 (from Greek Statistical Yearbook of Greece, 1940 (Πληθυσμός της Ελλαδός 1940)).[1320] One of the notable features in the Cyclades today, is the large number of un-tended agricultural terraces on the steepest, least accessible slopes. These terraces were probably maintained and supported agricultural production in the late 19th and early 20th century, a period before electrification, tourism, and the depopulation of people moving to Athens from the 1950s on. Arguably, an economic system not unlike that of the Archaic period. It suggests that a population of around 130,000 – 140,000 approaches the carrying capacity of the islands. The Late Archaic population of the Cyclades was likely at a similar level, as populous as the islands could support.

This analysis has demonstrated that making absolute population estimates with verifiable certainty based on archaeological data is a challenging undertaking. Enough assumptions must be made that it can call into question aspects of even the most reasonably thought through analysis. A more useful understanding perhaps can best be derived from relative analysis between periods within the same ecosystem. For the Cyclades, the data base of settlement sites by period as produced in Figs 4.132, 4.133, 4.134, 4.135 seems the most applicable technique for making a relative comparison between periods, but only if full recognition of a

[1320] See Sheedy 2006a, Table 4.

rural population that leaves no archaeological record behind is kept firmly in mind as that population was probably significant.

# 11 Appendix E: Trade Models and the Role of Gift Exchange

## 11.1 Introduction

Several scholastic models for trade have been developed. One of the common themes in the models is the practice of gift exchange as an organizing principle. The practice of gift-exchange centres around high ranking individuals exchanging gifts as a precursor for establishing trading relationships. The practice is well documented in the Late Bronze Age, but less so for the Iron Age. Nonetheless the concept of gift exchange remains a part of scholastic interpretations of Iron Age trade.[1321] This discussion will suggest that in the Cyclades, formalized gift exchange trade did not constitute an important part of the Iron Age economy.

## 11.2 Late Bronze Age Trade

The Eastern Mediterranean Late Bronze Age economy was dominated by large palace-based organizations in mainland Greece, Crete, Egypt, Asia Minor, and the Levant. Much of the success of the Aegean region during the Bronze Age has been attributed to its interconnectedness.[1322] Trade is at the forefront of interconnectivity. Hopkins wrote to understand the ancient economy we need to know the part played in it by trade and traders and reciprocally, to understand the role of trade and traders, we need some view of the ancient economy.[1323]

In analysing prehistoric trade in the Aegean, Renfrew developed four categories of exchange:[1324]

1. Down the line exchange wherein an item plentiful at one source is traded down the line in a series of steps with a decrease in availability as the

[1321] Murray 2017, 62-4; Morris 2007, 234-5; Reed 2003, 62-75.
[1322] Cline 2014, 43-72; 2009; Broodbank 2013, 2000; Horden and Purcell 2000.
[1323] Hopkins 1983, ix.
[1324] Renfrew 2011, 465-71.

item moves along. An example of this is the Neolithic trade in obsidian from Melos.[1325]

2. The Prestige Chain wherein prestigious gifts are then re-gifted to others. Amber from the Baltic in the Mycenaean period is an example of this type of exchange.[1326]
3. Freelance Commercial Trade wherein commercial trade motivated by profit is conducted by small scale freelance traders. This type of trade often involves agents and this trade is confined within the radius of transport.
4. Directional Commercial Trade in which useful commodities are moved from the source to a specific destination. This is regular, planned trade an example of which would be copper ingots from Cyprus to Crete. This type of trade usually occurred in raw materials.

The Late Bronze Age was a literate period and there are multiple surviving texts that provide evidence which give support to the theory of gift exchange as a common practice in the Bronze Age eastern Mediterranean. Ancient Akkadian tablets *c.* 1750 found at Mari on the western bank of the Euphrates recorded long distance trade and gift exchange. One tablet described the Marian King Zimri-Lim sending a pair of Minoan shoes as a gift to King Hammurabi of Babylon.[1327] These tablets describe gifting of luxury items and services between princes of Mari and other cities and kingdoms. As discussed in Chapters 3, many Egyptian and Near Eastern luxury items have been found in the Aegean as well as Aegean items in the East.[1328] Inscriptions in the Annals of the 42nd year of the reign of the Egyptian pharaoh Thutmose III use the phrase *wr Tanaja* (prince or chief of mainland Greece) as well as describing silver bowls Thutmose III received of *Keftiuan* (Cretan) origin or workmanship described as *inw* (tribute) that Cline suggested

[1325] Renfrew 2011, 440, 442-4, Fig. 20.1, Obsidian from Melos has been found at every Early Neolithic site in southern Greece.
[1326] Finley 1981a, 51 mentioned Baltic origin ambers in Mycenaean shaft graves.
[1327] Cline 2014, 18-20. Interestingly, Hammurabi returned the shoes.
[1328] Day, Quinn, Rutter and Kilikoglou 2011; Tomlinson, Rutter, and Hoffmann 2010; Rutter 2006; Watrous 1985, 8-9.

means 'gift' in this context.[1329] The Amarna Archives include a wide range of correspondence mostly dated to the reign of the Egyptian pharaoh Amenhotep III in mid-14th century. Among these were accounts of international contact involving gift giving to secure treaties or trade relations. In one letter Amenhotep III sent to Tushratta the King of Mitanni five chariots with teams of horses and to Queen Kelu-Hepa various items of gold jewellery and scented oil.[1330] A letter from the Egyptian pharaoh Akhenaten to Burna-Buriash II the Kassite king of Babylon includes a list of gifts that goes on for over 300 lines.

In the Greek world we can observe both the development of elite society and luxury goods. From the Linear B tablets we can derive place names, land-ownership, personal titles and levels of authority that suggest a centralized authority grew along the lines of a kin-based society.[1331] By the Late Helladic period the administration of the large palace centres developed towards rule by a single authority figure, the *wa-nax*.[1332] In the Linear B tablets many of the inventoried items are luxury goods such as perfumed oil, bronze, carved and inlaid furniture, and finely decorated ceramics.[1333] Specific items are marked *xenwia* (for foreigners). At Thebes traces of lapis lazuli and glass have been found in some workrooms. Ivory is assigned for working in the Pylos Va 482 tablet. The luxury trade is also revealed by the titles of some of the workers as recorded in Pylos tablet 239, *kuwanoworgos* (blue-glass worker), and *khrusoworgos* (gold worker) from Knossos tablet 231 and Pylos 239.[1334]

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[1329] Cline 2014, 25-6.
[1330] Cline 2014, 51-7; see Moran 1992 for translation of Armana Letters EA: 14, 17, 22, 24, 25, 41-44.
[1331] Bennet 2007, 192-5.
[1332] Shelmerdine and Bennet 2008, 290; Wright 2008, 238-9 discussed the development of authority from the earlier Middle Helladic period; Ventris and Chadwick 1956, 120, 411. Term *wa-nax* is recorded on tablets from Knossos (KN Vc73) and Pylos (PY 194, 235).
[1333] Shelmerdine and Bennet 2008, 296, 298.
[1334] Ventris and Chadwick 1956, 398-9.

The gift exchange system created a social network of relationships and obligations.[1335] The gifts are best thought of as acts of diplomacy to establish formal, political contact; after which merchants could conduct trade in items of a more commercial nature. Letters sent to and from Cyprus in the reign of Akhenaten describe a considerable quantity of copper shipped to Egypt. The King of Alashiya (Cyprus presumably, but there is some debate) apologized that the shipment was only 500 talents (a unit of weight in this instance, just over thirteen metric tons).[1336] The volume of material suggests that this was a trading relationship following a previously established gifting protocol. A series of documents preserved in the destruction levels of Ugarit give considerable insight into the significant extent of trade in the Late Bronze Age Mediterranean. These texts are one of the best insights into the range of perishable goods that were traded such as dyed woollen and linen garments, perfumed and edible oils, wheat, wine, and olives.[1337]

Evidence from two Late Bronze Age shipwrecks suggests that not all trade was arranged on a gift exchange protocol; one near Kaş in southern Turkey at Uluburun *c.* 1300, and a second off Cape Gelidonya *c.* 1200.[1338] Both ships were similar in construction methods and materials. The Uluburun hull was about 15 m long with a breath of 5 m and about 15 tons' displacement.[1339] Made of Lebanese cedar these were not insignificant coastal boats but were boats clearly capable of carrying meaningful amounts of cargo for extended distances. The Uluburun boat carried one ton of tin and nine tons of copper ingots as raw materials plus other items including a resinous material stored in 150 Canaanite jars (which suggests

[1335] Cline 2014, fig. 7.
[1336] Cline 2014, 60, see n37 on Alashiya debate.
[1337] Cline 2014, 104-8.
[1338] Cline 2014, 73-80; Pulak 2010, 862-76; Bass 2010; 1991; 1973.
[1339] Considerable portions of the Uluburun hull remain, much less of the Cape Gelidonya making the hull size estimation for that boat speculative. Bass 2010, 797 wrote the size was unknown.

the origin of the ship). The Cape Gelidonya boat similarly had copper and tin as well as scrap metals for recasting as part of its cargo.[1340] Lead-isotope testing of the copper ingots on both vessels suggest Cyprian origin, but there were slabs of copper that tests determined were from Lavrion.[1341] Other cargo items included glass ingots, resin, ivory from elephant tusk and hippopotamus teeth, African blackwood (*Dalbergia melanoxylon*), as well as spices and oils.[1342] Most likely these boats were sailing to the Aegean from the Levant with raw materials and returning with perishable cargoes of textiles, wine, and oils.[1343] The mixed nature of the cargoes gives the impression that these were independent traders operating for their own benefit but this is speculative.[1344]

## 11.3 Iron Age Trade Models

For the Early Iron Age, Morris proposed three economic systems or practices that incorporated both substantive and formalist concepts.[1345] The first system was the predominantly self-sufficient *oikoi* (household units) that took care of almost all their material needs and, from time to time, would produce a surplus of some commodity that would be sold off in known peripheral markets (or shortages covered).[1346] Azoria would be an example of this model (see Appendix C). Evidence of economic activity beyond food and material produced for internal consumption is not found in the surviving record of Azoria.[1347] The second system was trade involving entrepreneurs meeting at controlled trading spots such as Al Mina, Naucratis, or Kommos to exchange goods. As discussed in Chapter 3, there was

[1340] Bass 2010, 800, fig. 59.1.
[1341] Bass 2010, 800; Pulak 2010, 864-6.
[1342] Pulak 2010, 867-8.
[1343] Bass 2010, 801; Bachhuber 2006.
[1344] Bennet 2007, 203.
[1345] Morris 2007, 234-5.
[1346] Example Hes. *Op.* 423-36, 493-5.
[1347] Stefanakis, West III, Haggis, Mook, Fitzsimons, Scarry, and Snyder 2007, 288, n141 commented on the probable local scale of textile production; Haggis, Mook, Scarry, Snyder, and West III 2004, 371-2, 375,6, Fig. 24.

considerable evidence of Euboean, and Cycladic ceramics at Al Mina and elsewhere in northern Syria and the Levant. Morris's third system revolved around ritualized gift-exchange wherein high-level social leaders would meet for gift-exchange and feasting in a formalized manner that established frameworks for more substantial transactions. The practice of formalized gift-exchange followed on trade protocols from the Bronze Age. In the Iron Age, it was considered to be conducted by local aristocrats rather than palace-based organizations.[1348] Some finds at Lefkandi and in Cyprus have been interpreted as gift-exchange trade.[1349] However there is very little archaeological evidence of this practice in the Iron Age record of the Cyclades. As an explanatory basis for trade in the Aegean it seems anachronistic; gift exchange as a trade protocol is discussed in detail in Appendix E.[1350]

Trade has two institutional logics: mutual trade in surpluses where trading partners traded excess production (surplus grain for surplus wine) and non-directional trade in which private merchants acting on their own behalf bought and sold items for their own gain.[1351] The two approaches are complimentary. Private nondirectional trade could occur within a framing arrangement outlining the terms of trade established by a larger community.[1352] Examples of both patterns can be seen in the Archaic period. Solon's laws on restricting Athenian

[1348] Reed 2003, 62-75; Example *Od.* 1.180-4.
[1349] Coldstream 1983, 201-7 analysis of large Geometric Euboean origin kraters too large for regular use found in Amathous tomb 321 in Cyprus that he argued were part of a gift-exchange probably as part of metal trade in copper or tin; On Lefkandi Murray 2017, 96 most of the imports at Lefkandi come from LPG or SPG contexts, not EPG or MPG; Demand 2011, 226; Kourou 2008, 364, Fig. 3; Luke 2003, 56-57; Lemos 1996, 122; Popham, Sackett, and Themelis 1980, 223-4 (faience), 249-50 (bronze jugs), Plate 93; Kearsley 1999, 125-6 suggested that the opulent Near Eastern items in warrior graves at Toumba were payments received for mercenary service fighting for Near Eastern kings, perhaps in conflict with Assyrian expansion to the western coast of Syria and not gift-exchange.
[1350] Gift exchange has important social ramifications.
[1351] Bresson 2016, 382-3; Van Wees 2013b, 457-60; Reed 2003.
[1352] Bresson 2016, 383-87; Reed 2003, 66, 69, 73.

agricultural output to olive oil to be traded for grain is an example of the first.[1353] The Cycladic trade in kaolin, marble, *miltos*, and metal ores are examples of the second.

The Iron Age was non-literate following the end of the Bronze Age until sometime in the 8th century with the establishment of the Greek alphabet. The written records that make the Bronze Age discussion of gift exchange so insightful do not exist. In their place, archaeological evidence, and pieces of retrospective literature such as Homer have been used to try and recreate what happened during the illiterate interval.

Physical evidence is not voluminous. Coldstream suggested large Geometric Euboean origin kraters, too large for regular use found in Cyprus in Amathous tomb 321, were part of a gift-exchange probably as part of metal trade in copper. He interpreted these finds representative of gift-exchange trade.[1354] Rich grave goods from Toumba cemetery at Lefkandi have been speculatively considered gifts as some originated in Cyprus and the Near East.[1355] Mortuary finds of ten Cypriot items in five Iron Age tombs at Knossos have also been cited as gift-exchange evidence.[1356]

Literary references are similarly few, confined to passages in Homer and Hesiod.[1357] These suggest that the earliest post-bronze age traders were *aristoi*

[1353] Plutarch *Life of Solon,* 24.1; Bresson 2016, 402-3.
[1354] Coldstream 1983, 201-7.
[1355] On Lefkandi see Murray 2017, 95-100 most of the imports at Lefkandi come from LPG or SPG contexts, not EPG or MPG; Demand 2011, 226; Kourou 2008, 364, Fig. 3; Luke 2003, 56-57; Lemos 1996, 122; Thomas and Conant 1993, 93; Popham, Sackett, and Themelis 1980, 223-4 (faience), 249-50 (bronze jugs), Plate 93; Kearsley 1999, 125-6 suggested that the opulent Near Eastern items in warrior graves at Toumba were payments received for mercenary service fighting for Near Eastern kings, perhaps in conflict with Assyrian expansion to the western coast of Syria and not gift-exchange.
[1356] Murray 2017, 101, Table 2.5; Antoniadis 2017.
[1357] Murray 2017, 47-8; Reed 2003, 64-8.

which leads to the conclusion that the trade was arranged on a gift exchange basis.[1358]

> I declare that I am Mentes, the son of wise Anchialus, and I am lord over the oar-loving Taphians. And now have I put in here, as thou seest, with ship and crew, while sailing over the wine-dark sea to men of strange speech, on my way to Temese for copper; and I bear with me shinning iron…Friends of one another we do declare ourselves to be, even as fathers were friends from of old. (*Od.* 1.180-5, trans. A.T. Murray)

This oft-quoted passage as evidence for gift-exchange, upon inspection, relates a story of business conducted between multi-generational partners rather than an exchange of gifts to frame a trading relationship.[1359]

There is not much evidence for gift exchange in the literary record as a standard protocol of Iron Age trade. Nor is there compelling evidence of material remains indicative of gift exchange for this period. No Cycladic finds identifiable as gift exchange items have been identified. This suggests, if we did not have knowledge of the Bronze Age tradition of gift exchange, we would probably not hypothesize it as an exchange construct for the Iron Age Cyclades. There is considerably more evidence of trade conducted through emporiums such as Al Mina and Naucratis, suggestive of Renfrew's third category, Freelance Commercial Trade, and trade in marble from Paros and Naxos, suggestive of Directional Commercial Trade, than there is of gift exchange.

[1358] Tandy 1997, 4.
[1359] Morris 2007, 235 cited it as evidence of gift exchange.

# 12 Gazetteer of Sites

| ISLAND | SITE | NORTH LATITUDE | EAST *LONGITUDE* | Bronze Age Antecedent | Classical *Polis* |
|---|---|---|---|---|---|
| Amorgos | Aegiale | 36° 55' 11" | *25 ° 58' 49"* | N | Y |
| Amorgos | Arkesini | 36° 48' 36" | *25 ° 49' 2"* | N | Y |
| Amorgos | Markiani | 36° 47' 29" | *25 ° 50' 50"* | Y | N |
| Amorgos | Minoa | 36° 49' 16" | *25 ° 51' 46"* | N | Y |
| Amorgos | Mycenaean Cemetery | 36° 49' 57" | *25 ° 51' 57"* | Y | N |
| Amorgos | Roman Tombs | 36° 49' 38" | *25 ° 51' 37"* | N | N |
| Anaphe | Anaphe Polis | 36° 21' 31" | *25 ° 47' 59"* | N | Y |
| Anaphe | Sanctuary of Apollo Aigletes | 36° 21' 28" | *25 ° 49' 46"* | N | N |
| Andros | Hypsili | 37° 50' 31" | *24° 47' 42"* | N | N |
| Andros | Palaeopolis | 37° 48' 58" | *24° 49' 24"* | N | Y |
| Andros | Zagora | 37° 46' 50" | *24° 51' 12"* | N | N |
| Ano Antikeri | Island Location | 36° 51' 4" | *25 ° 40' 49"* | Y | ? |
| Attica | Athens, Agora | 37° 58' 20" | *23 ° 43' 22"* | Y | Y |
| Attica | Lavrion | 37° 43' 56" | *24 ° 2' 1"* | Y | N |
| Corinth | Corinth (Town) | 37° 54' 20" | *22 ° 52' 47"* | Y | Y |
| Crete | Azoria | 35° 7' 50" | *25 ° 52' 6"* | Y | N |
| Crete | Gortyn | 35° 3' 46" | *25 ° 56' 30"* | N | Y |
| Crete | Gournia | 35° 6' 35" | *25 ° 47' 34"* | Y | N |
| Crete | Itanos | 35° 15' 47" | *25 ° 15' 30"* | N | Y |
| Crete | Kastro | 35° 6' 40" | *25 ° 52' 30"* | N | N |
| Crete | Katalimata | 35° 5' 48" | *25 ° 50' 11"* | N | N |
| Crete | Khalasmeno | 35° 5' 20" | *25 ° 49' 30"* | N | N |
| Crete | Knossos | 35° 17' 52" | *25 ° 9' 28"* | Y | Y |
| Crete | Kommos | 35° 0' 50" | *25 ° 45' 23"* | Y | N |
| Crete | Lato | 35° 10' 43" | *25 ° 39' 13"* | N | Y |
| Crete | Malia | 35° 18' 31" | *25 ° 31' 27"* | Y | N |
| Crete | Molchos | 35° 11' 12" | *25 ° 54' 23"* | Y | N |
| Crete | Palaiokastro | 35° 11' 43" | *25 ° 16' 32"* | Y | N |
| Crete | Phaistos | 35° 3' 50" | *25 ° 48' 52"* | Y | N |
| Crete | Pseira | 35° 11' 14" | *25 ° 51' 43"* | Y | N |
| Crete | Vondra | 35° 6' 36" | *25 ° 51' 38"* | N | N |
| Cumae | | 40° 50' 31" | *14 ° 3' 21"* | ? | Y |
| Delos | Sanctuary | 37° 24' 37" | *25 ° 16' 18"* | N | Y |
| Donousa | Vathy Limenari | 37° 5' 26" | *25 ° 48' 50"* | N | N |
| Euboea | Chalchis | 38° 27' 39" | *23 ° 36' 6"* | Y | Y |
| Euboea | Eritriea | 38° 23' 50" | *23 ° 47' 24"* | Y | Y |
| Euboea | Karystos | 38° 0' 54" | *24 ° 25' 14"* | ? | Y |
| Euboea | Lefkandi | 38° 24' 34" | *23 ° 40' 57"* | Y | N |
| Euboea | Toumba | 38° 24' 48" | *23 ° 40' 23"* | N | N |

| ISLAND | SITE | NORTH LATITUDE | EAST *LONGITUDE* | Bronze Age Antecedent | Classical *Polis* |
|---|---|---|---|---|---|
| Folegandros | Chora | 36° 37' 36" | *24 ° 55' 8"* | N | Y |
| Folegandros | Karavostasis | 36° 36' 58" | *24 ° 56' 57"* | N | N |
| Folegandros | Palaiokastro | 36° 37' 51" | *24 ° 55' 35"* | N | N |
| Herakleia | Island Location | 36° 50' 23" | *25 ° 26' 58"* | Y | Y |
| Ikaria | | 37° 34' 19" | *26 ° 5' 17"* | ? | Y |
| Ios | Chora | 36° 43' 22" | *25 ° 16' 57"* | N | Y |
| Ios | Ormos Bay | 36° 43' 25" | *25 ° 16' 9"* | N/A | N/A |
| Ios | Poseidon Phytalmios | 36° 43' 50" | *25 ° 22' 10"* | N | N |
| Ios | Skarkos | 36° 43' 54" | *25 ° 16' 57"* | Y | N |
| Kato Antekeri | Island Location | 36° 49' 58" | *25 ° 40' 4"* | Y | ? |
| Kato Koufonisi | Island Location | 36° 54' 41" | *25 ° 34' 49"* | Y | ? |
| Keos | Ayia Irini | 37° 40' 43" | *24 ° 19' 34"* | Y | N |
| Keos | Ioulis | 37° 38' 12" | *24 ° 20' 24"* | N | Y |
| Keos | Karthaia | 37° 33' 26" | *24 ° 19' 30"* | N | Y |
| Keos | Koressos | 37° 39' 24" | *24 ° 18' 18"* | N | Y |
| Keos | Platis Yialos Mines | 37° 32' 29" | *24 ° 16' 55"* | N/A | N/A |
| Keos | Poieessa | 37° 35' 47" | *24 ° 16' 32"* | N | Y |
| Keros | Island Location | 36° 53' 32" | *25 ° 38' 42"* | Y | Y |
| Kimolos | Cimoline Quarries | 36° 49' 43" | *24 ° 35' 48"* | ? | N/A |
| Kimolos | Palaiokastro (appx.) | 36° 47' 53" | *24 ° 33' 13"* | N | N |
| Kimolos | Polis | 36° 47' 17" | *24 ° 31' 48"* | N | Y |
| Koufonisi | Island Location | 36° 56' 35" | *25 ° 36' 7"* | Y | ? |
| Kythnos | Ayia Ioannis | 37° 24' 5" | *24 ° 28' 12"* | N | N |
| Kythnos | Kastellas | 37° 21' 47" | *24 ° 24' 32"* | N | N |
| Kythnos | Kastro | 37° 27' 49" | *24 ° 24' 35"* | N | N |
| Kythnos | Maroulas | 37° 26' 49" | *24 ° 25' 45"* | Y | N |
| Kythnos | Skouries | 37° 25' 2" | *24 ° 28' 20"* | ? | N |
| Kythnos | Vrykastro | 37° 24' 29" | *24 ° 23' 32"* | N | Y |
| Levitha | | 37° 0' 9" | *26 ° 28' 4"* | N | N |
| Melos | Aghios Spyridon | 30° 42' 33" | *24 ° 22' 41"* | Y | N |
| Melos | Ancient Melos | 36° 44' 20" | *24° 25' 16"* | N | Y |
| Melos | Emborio | 36° 42' 32" | *24° 23' 18"* | N | N |
| Melos | Phylakopi | 36° 45' 20" | *24° 30' 12"* | Y | N |
| Mykonos | Kastro | 37° 26' 49" | *25 ° 19' 36"* | ? | Y |
| Mykonos | Palaiokastro | 37° 27' 19" | *25 ° 23' 19"* | Y | Y |
| Naucratis | | 31° 12' 9" | *30° 31' 23"* | ? | N |

| ISLAND | SITE | NORTH LATITUDE | EAST *LONGITUDE* | Bronze Age Antecedent | Classical *Polis* |
|---|---|---|---|---|---|
| Naxos | Aplomata | 37° 6' 31" | *25 ° 22' 46"* | Y | N |
| Naxos | Emery Mines | 37° 7' 31" | *25 ° 33' 48"* | N/A | N/A |
| Naxos | Grotta | 37° 6' 30" | *25 ° 22' 33"* | Y | N |
| Naxos | Kalados | 36° 55' 59" | *25 ° 28' 17"* | N | N |
| Naxos | Kastro | 37° 6' 22" | *25 ° 22' 37"* | ? | Y |
| Naxos | Marble Quarries | 37° 5' 10" | *25 ° 28' 17"* | N/A | N/A |
| Naxos | Mitropolis | 37° 6' 37" | *25 ° 22' 37"* | Y | N |
| Naxos | Palatia | 37° 6' 37" | *25 ° 22' 23"* | Y | N |
| Naxos | Panormos Bay | 36° 57' 20" | *25 ° 32' 3"* | N/A | N/A |
| Naxos | Sangri | 37° 1' 45" | *25 ° 25' 53"* | N | N |
| Naxos | Stelida | 37° 5' 15" | *25 ° 20' 45"* | N | N |
| Naxos | Tsikalario | 37° 3' 52" | *25 ° 27' 49"* | N | N |
| Naxos | Yria | 37° 4' 40" | *25 ° 22' 52"* | Y | N |
| Paros | Aghios Georgios | 36° 58' 42" | *25 ° 1' 53"* | N/A | N/A |
| Paros | Delian Apollo | 37° 6' 13" | *25 ° 9' 18"* | N | N |
| Paros | Despotiko | 36° 58' 12" | *25 ° 00' 42"* | N | N |
| Paros | Detis | 37° 8' 45" | *25 ° 13' 26"* | N | N |
| Paros | Filizi | 37° 7' 28" | *25 ° 17' 27"* | ? | N |
| Paros | Kargadoura | 37° 8' 31" | *25 ° 17' 33"* | ? | N |
| Paros | Koukounaries | 37° 7' 46" | *25 ° 12' 18"* | Y | N |
| Paros | Livadera | 37° 7' 56" | *25 ° 12' 20"* | ? | N |
| Paros | Marathi-Mines | 37° 4' 43" | *25 ° 12' 6"* | N/A | N/A |
| Paros | Oikonomou | 37° 7' 44" | *25 ° 15' 30"* | ? | N |
| Paros | Paroikia | 37° 5' 30" | *25 ° 8' 30"* | Y | Y |
| Paros | Plastiras | 37° 7' 50" | *25 ° 13' 11"* | Y | N |
| Paros | Protoria | 37° 6' 40" | *25 ° 12' 28"* | ? | N |
| Paros | Sarakinika | 37° 6' 43" | *25 ° 13' 46"* | ? | N |
| Paros | Sklavounai | 37° 7' 03" | *25 ° 12' 35"* | ? | N |
| Paros | Tsimintiri | 36° 58' 35" | *25 ° 1' 6"* | ? | N |
| Pithekoussai | | 40° 45' 26" | *13 ° 52' 57"* | ? | Y |
| Rhenia | Sanctuary | 37° 24' 58" | *25 ° 12' 36"* | N | Y |
| Schinousa | Island Location | 36° 52' 27" | *25 ° 31' 4"* | Y | Y |
| Serifos | Kastro | 37° 9' 13" | *24 ° 31' 21"* | ? | Y |
| Serifos | Livadi | 37° 8' 40" | *24 ° 31' 7"* | N/A | N/A |
| Sikinos | Ancient Sikinos | 36° 39' 46" | *25 ° 5' 27"* | N | Y |
| Sikinos | Palaiokastro | 36° 42' 44" | *25 ° 10' 30"* | N | N |
| Sikinos | Port | 36° 40' 37" | *25 ° 8' 39"* | N | N |
| Siphnos | Aghios Andreas | 36° 57' 15" | *24 ° 43' 18"* | Y | N |
| Siphnos | Aghios Nikitas | 37° 0' 49" | *24 ° 42' 20"* | N | N |
| Siphnos | Aghios Sostiris Mines | 37° 1' 25" | *24 ° 42' 46"* | Y | N |
| Siphnos | Kastro | 36° 52' 28" | *24 ° 44' 44"* | Y | Y |
| Siphnos | Platis Yialos Mines | 36° 55' 50" | *24 ° 43' 49"* | N | N |
| Siphnos | Profitis Elias Troulakiou | 37° 1' 52" | *24 ° 40' 23"* | N | N |
| Siphnos | tis Baronas to Froudi | 36° 55' 58" | *24 ° 41' 4"* | Y | N |
| Siphnos | White Tower | 36° 55' 43" | *24 ° 44' 17"* | N | N |

| ISLAND | SITE | NORTH LATITUDE | EAST *LONGITUDE* | Bronze Age Antecedent | Classical *Polis* |
|---|---|---|---|---|---|
| Syria | Al Mina | 36° 3' 39" | *35 ° 58' 24"* | N | N/A |
| Syros | Ermoupolis | 37° 26' 15" | *24 ° 55' 58"* | N | Y |
| Syros | Galessos | 37° 25' 19" | *24 ° 52' 43"* | ? | N |
| Syros | Grammata | 37° 29' 58" | *24 ° 53' 26"* | ? | N |
| Tenos | Kardiani | 37° 36' 24" | *25 ° 4' 35"* | ? | N |
| Tenos | Mycenaean Tholos | 37° 39' 13" | *25 ° 1' 48"* | Y | N |
| Tenos | Sanc. Poseidon and Amph. | 37° 33' 8" | *25 ° 8' 33"* | N | N |
| Tenos | Tenos (Chora) | 37° 32' 19" | *25 ° 9' 48"* | N | Y |
| Tenos | Thesmophorieon | 37° 34' 30" | *25 ° 10' 5"* | N | N |
| Tenos | Unexplored Acropolis | 37° 32' 51" | *25 ° 9' 46"* | ? | ? |
| Tenos | Vrykastro | 37° 31' 34" | *25 ° 11' 19"* | Y | N |
| Tenos | Xobourgo | 37° 34' 31" | *25 ° 10' 3"* | ? | Y |
| Thera | Akrotiri | 36° 21' 3" | *25 ° 23' 56"* | Y | N |
| Thera | Kamari | 36° 22' 19" | *25 ° 28' 51"* | N | N |
| Thera | Koimissi | 36° 25' 26" | *25 ° 20' 55"* | N | N |
| Thera | Oia | 36° 27' 51" | *25 ° 22' 41"* | N | N |
| Thera | Perissa | 36° 21' 23" | *25 ° 28' 20"* | N | N |
| Thera | Thera (Town) | 36° 21' 51" | *25 ° 28' 42"* | N | Y |

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